SASKATCHEWAN CATTLE FEEDERS ASSOCIATION

University of Saskatchewan

Saskatchewan Agriculture

3RD ANNUAL SASKATCHEWAN CATTLE FEEDERS SHORT COURSE

"OWNERSHIP — FROM CALVING THROUGH SLAUGHTER"

OCTOBER 22 and 23, 1986
SASKATOON, SASKATCHEWAN

87-03058/

THIRD ANNUAL SASKATCHEWAN CATTLE FEEDERS SHORT COURSE

Ownership - From Calving Through Slaughter

October 22 and 23, 1986
Travelodge Motor Hotel, Saskatoon, Saskatchewan

Sponsored by:

The Saskatchewan Cattle Feeders Association
Saskatchewan Agriculture
and
The University of Saskatchewan

Proceedings compiled and edited by:

C.E. Yuzak

TABLE OF CONTENTS

RETAINED OWNERSHIP AND THE HOLISTIC RESOURCE MANAGEMENT CONCEPT
Blake Holtman
Shipwheel Cattle Feeders Limited
Taber, Alberta.....1

BREEDING FOR THE FEEDLOT MARKET
John Stewart-Smith
Beefbooster Cattle Ltd.
Cochrane, Alberta.....11

INFORMATION OBTAINED ON RETAINED OWNERSHIP
Jim Armstrong, Livestock Specialist
Tisdale, Saskatchean.....21

SELECTING FEEDERS
Ray Baird, Manager
Clavelle Farms Ltd.
Viscount, Saskatchewan.....25

SELECTION OF FINISHED CATTLE
Dennis Wobeser, Owner and Manager
Hi-Gain Feedlot
Lloydminster, Saskatchewan.....27

GENETIC REQUIREMENTS FOR THE FEEDLOT MARKET
Al Hingston, Beef Program Manager
Saskatchewan Agriculture
Regina, Saskatchewan.....32

SOME ECONOMIC ASPECTS OF THE CANADIAN BEEF INDUSTRY
Dr. Andy Schmidtz, Professor
Van Fleet Chair, Dept. Agriculture Economics
University of Saskatchewan
Saskatoon, Saskatchewan.....41

ANIMAL HEALTH UPDATE AND PRECONDITIONING
Dr. Terry Church, Head
Preventative Medicine Branch
Animal Health Division
Alberta Agriculture
Edmonton, Alberta.....51

RATION BALANCING
Dr. Roger D.H. Cohen, Professor
Department of Animal and Poultry Science
University of Saskatchewan
Saskatoon, Saskatchewan.....59

RECORD KEEPING
Ken Ewen
Poundmakers Feedlot Ltd.
Lanigan, Saskatchewan.....67

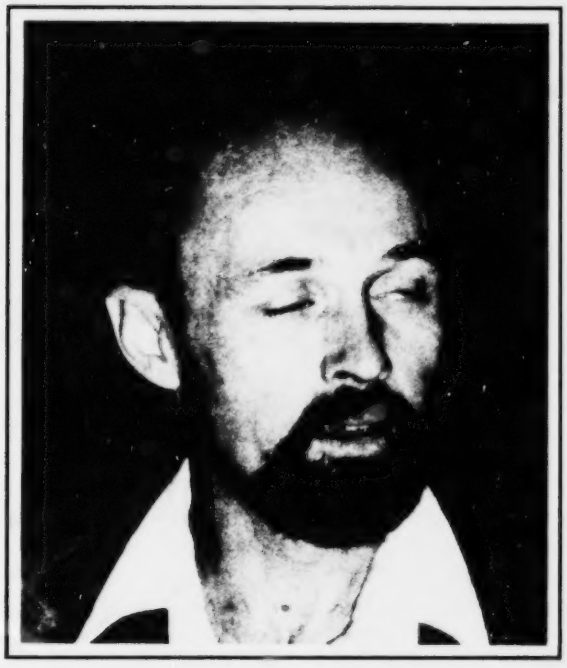
PERSONNEL/CUSTOMER RELATIONS
Terry Manning
Animal Health Division
Elanco, Division of Eli Lilly Canada Inc.
Calgary, Alberta.....69

STEER AND HEIFER FUTURITY PROGRAM
Rick Koller, Feedlot Specialist
Saskatchewan Agriculture
Saskatoon, Saskatchewan.....78

SASKATCHEWAN CATTLE FEEDERS ASSOCIATION SORGHUM PROJECT
Gail Gerber, Technician
Oxbow, Saskatchewan.....81

CLOSING REMARKS
Ken McDonald, President
Saskatchewan Cattle Feeders Association
Indianhead, Saskatchewan.....84

RETAINED OWNERSHIP AND THE HOLISTIC RESOURCE MANAGEMENT CONCEPT



Blake Holtman
Shipwheel Cattle Feeders Ltd.
Box 2289
Taber, Alberta T0K 2G0

Holistic Resource Management (HRM) is a difficult concept to grasp. It is a life's learning process. HRM is not like other tangible tools that we would often associate with resolving many of the current agricultural problems. I want to briefly describe some of the things we have learned that apply to retained ownership and will then attempt to explain the HRM concept in more depth. Since we started HRM, we have been able to graze at double the recommended stocking rate on what was a poorly managed, run down ranch. This grazing was accomplished without the use of any fertilizers, chemicals, weed sprays or insecticides. Even through the dry years we experienced two years ago we were still able to maintain stocking rates when other ranchers had to cut back.

My objective is to sufficiently jarr your thinking that you realize there are alternatives to the normally accepted methods of ranching practiced today.

Of the 100 years that agriculture as we know it has been in Canada, today is one of the most exciting times, providing countless opportunities. Farming and ranching decisions may be difficult to make today, governments are perhaps not doing the right thing, interest rates are too high and commodity prices are too low. But there is definitely not a lack of opportunity. Opportunities exist that are capable of providing challenges beyond anything our creative minds can comprehend. I have nothing to sell, nor advice worth paying for, but can relate our experiences, past and present, and what future direction we are taking with HRM.

Retained Ownership

Kansas State University recently conducted a study showing that during 7 of the last 10 years, the producer would have been better off retaining the ownership of his cattle. If retained ownership is being considered or is already part of your cattle operation, recognizing some of the often neglected factors can increase your returns.

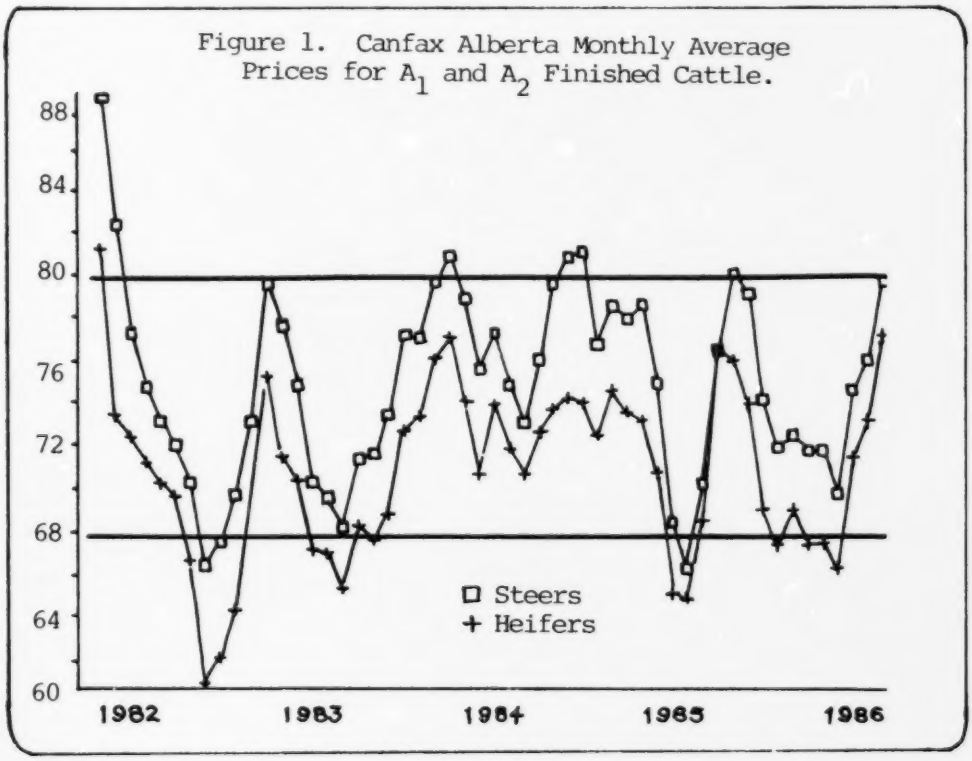
A cattle producer would likely want $1.15 per pound for 500 lb crossbred calves going to a feedlot today. The feedlot operator would only be willing to pay $1.00. Realistically, only top-enders would sell for $1.15 at the auction market. The average price would likely be $1.07. The breakeven price is the price an animal must sell for when finished to cover purchase and feed costs. The breakeven on a 500 lb calf bought at $1.07 would be :

Purchase of 500 lb @ 1.07	= $535
Feed @.50/lb gain x 650	= $325
total cost	$860

Breakeven price= $860/1150lb =
$74.25 per cwt.

Canfax Alberta publishes a chart showing current fluctuations in fat cattle prices (figure 1). Fat cattle prices generally fluctuate between $68 and $80 per cwt. Extremes occur at either end, but normally only last for about two weeks. Prices are now at the high end of this range. It is important to always know where you are selling within this fat range. If you are offered $1.00 or $1.02 per lb for those calves now, you can be sure that you are selling down at a 70 or 71 cent fat price break even. Should you be doing that? You would be selling your cattle now at the bottom end of the market.

Figure 1. Canfax Alberta Monthly Average Prices for A_1 and A_2 Finished Cattle.



Producers seldom sell to a feedlot with a pre-established shrink for less than what the present market price is. Because of the unknown shrink factor at the auction market, that decision is not always correct. One of our customers sold 165 steer calves at an auction market. The cattle were weighed at 4:30 on an afternoon shipment into the auction market. They were sold the following afternoon at 1:30. Shipwheel weight was 112,890 lb; auction market weight was 103,766 lb. Shrink to the auction market was 8.1%. Shipwheel would have paid on a basis of 4% shrink. The producer received $86.50 per cwt gross by selling at the auction market and netted $84.24 per cwt after deductions involved with selling through the auction system. By selling to Shipwheel, using Shipwheel weights and a 4% shrink factor, the producer could have netted the same amount of money had he been paid only $80.65 per cwt. He could have been paid 6 cents less per cwt by the feedlot and have received the same final dollar.

Not many producers consider the effect of shrink. They brag about prices they receive at the auction market for their top-end calves, but neglect to mention the bottom-end calves, shrink and other factors. Shrink alone at 8% is 40 pounds. At $1.00 per pound, shrink costs $40 a head. Knowing the costs of marketing cattle through auctions can assist in making selling decisions.

The most important management tool in a feedlot is knowledge of feed consumption. An example of a chart we produce weekly at Shipwheel is shown in figure 2. The dotted line on top shows the dry matter (DM) consumption in kg per head. The minute the DM consumption starts dropping down, the pullrate a day later goes up. As consumption goes back up, the pullrate goes down and the problem is over. Good management is knowing when consumption is going to fall and being able to correct the situation before it and associated problems occur.

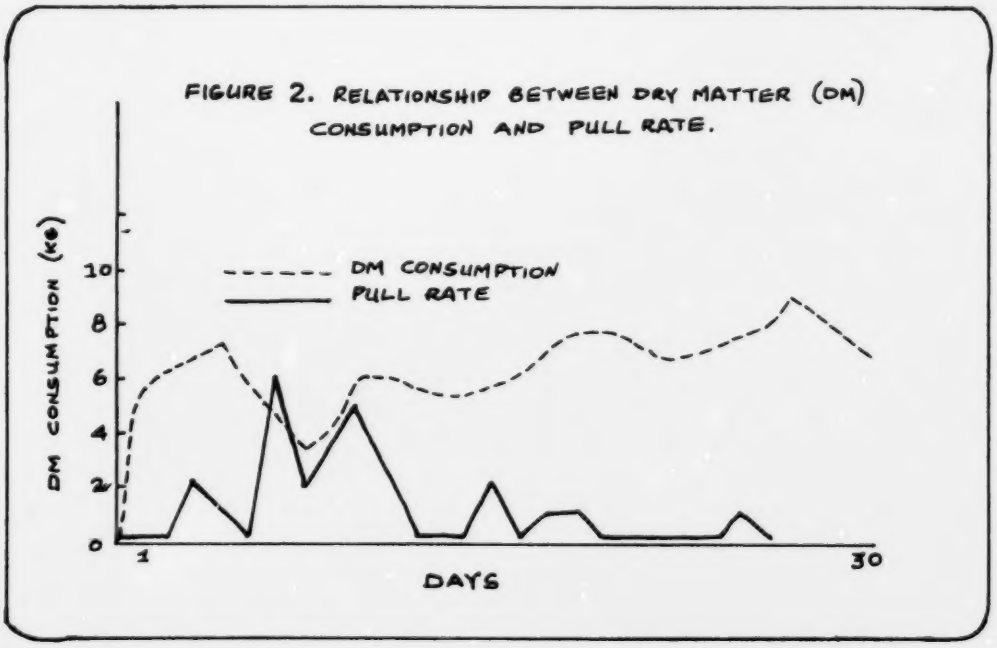
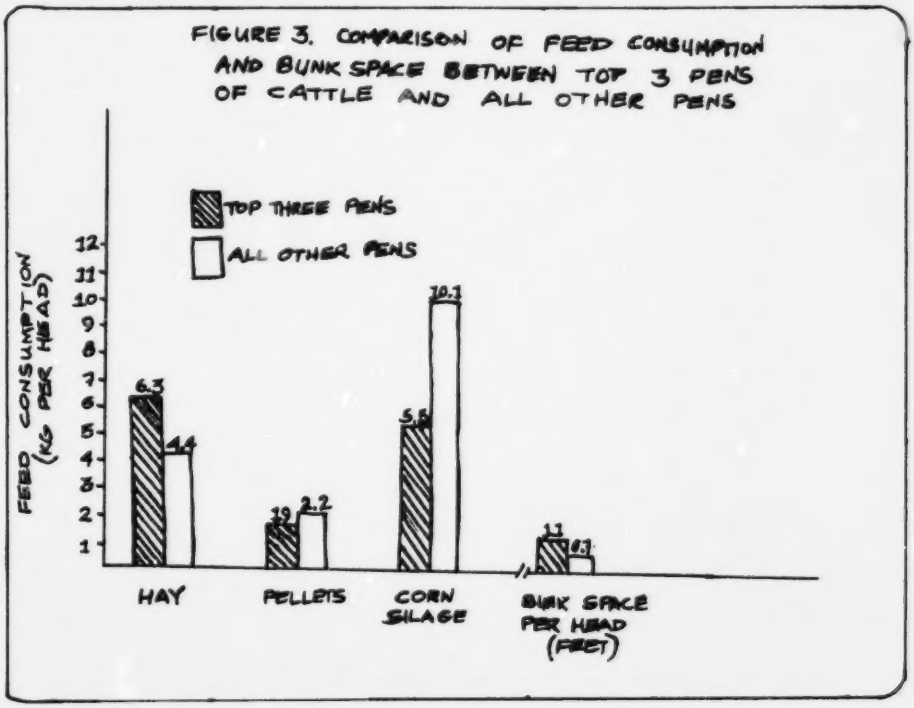


FIGURE 2. RELATIONSHIP BETWEEN DRY MATTER (DM) CONSUMPTION AND PULL RATE.

To determine why there were such variations in the performance of our feeder cattle in 1982-83, we compared our top three pens of cattle to all other pens. A total of 2800 head of calves were involved. The top three pens of calves consumed more hay (figure 3), less pelleted ration and less corn silage than did all other pens. The top pens also had 33.6% more bunk space than other cattle.



Buyers often suggest that finished cattle should be pre-sorted into a separate pen prior to offering them for sale. It is our experience that pre-sorting is costly. For example, on July 26 we sorted a pen of 83 steers, put 51 back in their home pen and held 32 animals in a separate pen until they were sold on August 5. Sale weight on August 5 was 33427 lb. Sorted weight on July 26 was 33648 lb. Net weight loss was 221 lb. Consumption by the sorted cattle was similar to that of the group that went back to their home pen (11.9 and 11.8 kg/hd /day). Sorted cattle consumed an extra $494 worth of feed, cost $32 in yardage fees and $165.97 (221 lb @ 75.10/cwt) in weight loss during the time they were held, rather than being sold immediately after sorting. It was estimated that sorted calves lost 2 lb/head/day gain compared with the group returned to their nome pen, which cost $480.64. Total estimated loss by pre-sorting was $1172.61 or $36.64 per head.

There is some variation in the effect of pre-sorting, but losses occurred in about 90% of the cases we checked. We pre-sorted and held 48 heifers for 3 days. The cost of pre-sorting was $13.67 per head. In both these cases, animals were only sorted out and put in a separate pen. They were not mixed with cattle from other pens. If cattle were mixed, the problem would be magnified because stress and shrink would be that much greater. We did have some cases of actual gain. We pre-sorted 85 heifers and held them for 7 days. The actual gain from pre-sorting was $12.05 per head, but we could not explain why a gain occurred.

Monitoring feed consumption is the key factor in minimizing feedlot problems. In making a decision about when and where to sell, whether to pre-sort, etc. knowledge of shrink, when it occurs and how to negotiate it, knowledge of the price cycles and knowledge of the cost of marketing cattle through auctions can aid the decision-making process and increase returns. The process of marketing and how it is handled is as important as the management of the cattle when they are in the feedlot.

A decision of whether to retain ownership of your cattle should be based on maximizing returns to that particular land base. We call it the gross margin approach. The variable costs associated with any enterprise should be considered. Land costs are fixed and can be ignored. The objective is to determine whether that particular operation returns the most money to that land. In a feeder operation, consider stock purchases, feed, vet and yardage costs, salaries and selling costs. Add interest charges attributed to that particular enterprise. Adjust for beginning and ending inventory. Estimate total returns. The net result is a gross margin figure. This simple model can generate the information required in decisions regarding retaining ownership of cattle or what other alternatives are available.

Holistic Resource Management

We refer to the grazing method we use as Holistic Resource Management or HRM because it is much more than a tool and unlike other tools such as the equipment, chemicals or computer programs often adopted in agricultural practice.

For some time I had been bothered by our grazing methods. I often think back to my teenage formative years on an irrigated farm in Taber when my father would seed a pasture to grass on prime irrigated land. He did an excellent job of irrigating, fertilizing, seeding the land, spraying and getting a superb lush growth of forage, only to find that with the grazing method we were using the forage slowly deteriorated and within 5 to 8 years we were plowing up the grassland and starting the whole process over again. I was not able to completely resolve the situation until I heard Allan Savory speak in Pheonix, Arizona in 1979. His presentation completely changed my way of thinking and my attitude, not only about grazing, but about farming practices in general today. I believe that our range condition over the last 100 years has been deteriorating at a rapid pace. My motive for adopting HRM was a simple case of range improvement.

I had attended many other discussions and workshops but could not afford the advice I was receiving about improving the range by tearing up grass, reseeding, spraying for weeds and insects, ripping up brush encroachment, and turning around and repeating the process when the problem recurred. To me this was a simple case of treating the symptoms, but not really getting down to the cause of the problem.

To understand how HRM can become part any operation, the signs of a deteriorating agricultural base and some global shifts in production must first be recognized. Soil erosion and desertification make the headlines in may papers and magazines today. In the most recent issue of the Country Guide the front page and cover story was on soil erosion, showing a photo of a ditch full of soil that had drifted in. Numerous other magazines have articles about farmers trying various cropping methods in an attempt to halt soil erosion. Soil desertification often brings to mind the Third World countries where the desert sands are moving in at an alarming rate. It is seldom realized that the

same problems are occuring in our own country, and in many cases on our own farms or ranches.

Desert spread is usually linked to overstocking or overgrazing livestock. Crop lands are important but in most countries cover only 10% of the land base. In view that the other 90% of the land base is tied up in grassland, be it publicly or privately owned, range or recreational, HRM focuses on the range. As ranges are improved, HRM will eventually encompass croplands. The visible effects of soil erosion are far greater on crop land than on grazing land. Many of our grasslands have slowly deteriorated to less complex and low succession grasses that yield small amounts of forage and are of low productivity. We have been ripping up and reseeding these ranges at extremely high costs.

Modern agriculture is in a huge transition era. Many producers are looking for alternative methods to conventional agricultural practices. Another sign of this transition is China. China has become a net exporter of grain during the last decade. The real problem to the North American farmer is that China is able to produce crops with a minimal investment of high technology, in particular $50,000 tractors and $100,000 combines. They are competing with North American farmers for grain markets but their costs of production are much lower. This is a threat to both grain and beef producers. China has now started to produce more pork and beef. If they continue in a manner similar to what they have accomplished with grain production, our cattle industry could suffer.

There are some alarming signs in agriculture today. It is imperative that we begin to totally understand how some of those global problems affect each of us directly in our own enterprises. What we have done to our cropping and rangeland in 100 years took nearly 2000 years in the Third World countries. At the same time we are trying to compete with a country like China that can put grain at our doorstep for half the cost of domestic production. North American agriculture today uses 30 calories of chemical energy to produce 1 calorie of solar energy in food. This illustrates one problem that must be tackled in order that we may compete with a country like China and at the same time halt soil desertification. A means of production that does not require tremendously high input costs must be developed, a method that produces the same amount of food from the land but one that uses less energy in the form of equipment, chemicals and fertilizers. Solar energy must be relied on more.

Another approach to understanding HRM is to consider each individual ranch as a closed system that must generate all financial resources necessary to sustain it and the people living there. Any unproductive use of the financial resources on this ranch would drain or damage the system. By understanding this, it is possible to visualize that the only energy sources available are the sunlight energy and creative human energy. All that can be produced on any piece of land is what can be converted from sunlight energy into a marketable product. It also becomes easier to see that as one calorie of energy goes into the ranch, only one calorie of energy can be generated.

In this closed system, more calories can be generated with sunlight energy from the ranch, but this must be done with the land and human resources only. Out-of-pocket expenditures on needless equipment and chemicals would jump the system back into the 30 calorie expenditure. Spending 30 calories to produce only 1 calorie will eventually lead to bankruptcy. This is what is happening on many farms and ranches today. An investment of this energy money that is wasted today does not in any way

generate increasing energy money at a later date. Any increase or growth in energy from the ranch must be generated from the ecosystem itself.

In a closed economic system the weakest links in the operation must be identified and improved. Money spent on anything other than the weakest link consumes or wastes energy money already made on the ranch and weakens its whole position. True energy money from the ranch or farm is obtainable only in two ways . One is by consuming what is called biological capital, which has supported many ranchers over the last 100 years. Biolcgical capital is what has been deteriorating for the last 100 years to the point where ranges contain less complex and low succession grasses. The second way to obtain true energy money is to generate new biological capital. That is what Holistic Resource Management is attempting to do. HRM is developing a way that can begin to turn the shift around from the low succession, low energy production off the ranch back to higher succession plants and a higher energy return. In essence, HRM is a system that attempts to generate new biological capital.

When I first started with HRM I was impressed with its goals and ideals, but I totally misjudged the complexity to understanding and practising HRM. One of the biggest problems that HRM has had to face is that many people look at it as a rotational system with a lot of fences radiating out from a central watering bowl. HRM is global in nature and one's attitude must be able to recognize and become aware of the changes that go on around us and begin to realize how those large things outside of us are affecting our own farms or ranches. Thus the name Holistic where individual parts and separate entities cannot be studied, but rather the interrelationships between the parts. I do not believe that the high interest rates, low commodity prices and lack of government foresight are the real problems faced by agriculture today. They are merely symptoms of the problem. We have been spending petro dollars at a far greater rate than we have been able to generate solar energy and this can only lead to a bankrupt ranch, nation or country.

In our own particluar case in the last six years, but not prior to that, we have not spent one dollar on chemicals, fertilizer, weed killer, or brush clearing but have been able to maintain double the stocking rate on what was a poorly managed, run down ranch. We are just now beginning to see the condition of the range improve. We've gone through three years in succession of drought, one the worst in 65 years. During that time our neighbours who practice conventional grazing had to destock. We did not destock once.

HRM has a model that attempts to combine all of the things going around us in a holistic manner, including how global shifts affect us on the ranch . The model identifies our goals and what ecosystem blocks we have, such as plant succession, the water and mineral cycles and energy flow. Included are the tools we have available (rest, fire, grazing, animal impact, wildlife and technology) and various guidelines we can follow. Much of our model is based on experience and intuition.

Allan Savory , the founder of HRM, had identified four missing keys to grazing by observing the effects herding animals had on the land. The first missing key was that before man's interference, plants, soils and animals had evolved together and needed each other for their own health. The way an environment reacted to herding animals depended on the climate and decay process present. Brittle environments had erratic rainfall and a slow decay process. To be productive and stable these environments needed the herding

animals. Non-brittle environments had reliable rainfall and a rapid decay process. Productivity and stability were not dependent on herding animals. That was the second missing key. The discovery that overgrazing was not caused by the presence of too many animals, but was due to how long the animals grazed in any one place was the third missing key. Savory applied these ideas to the management of livestock on rangelands. If livestock could be run so that they didn't overgraze but could still stimulate the beneficial treatment of the soil, they could only do good. Those early techniques had some unexpected failures, which were due to not understanding the complexity and unity of Nature. Hence, the concept of Holism, in which all the parts of Nature are interrelated, with each affecting the other and none understood in isolation. This lead to the fourth missing key, that it is only through the study and manipulation of these interrelationships that our complex ecosystems can be understood and managed.

Construction of the grazing unit or cell is not the important item. It is a tool like any other piece of technology. The design is basically a central watering area with paddocks radiating out like spokes on a wheel. We often get comments that with a design like this, the grass around the center of the cell will over time tramp out. Some of our best growth is around the center. The reason for this is timing.

Tramping by the cattle breaks up the capping effect on the surface of the ground to allow water to penetrate and improve the aeration of the ground. Expensive equipment is not necessary for aeration. If managed properly, plants and animals can accomplish the same thing. Trampling and then allowing a rest period so grasses have a chance to grow effectively eliminates brush encroachment as it cannot compete.

We often hear comments that we allow the cattle to go into a paddock and graze everything off. We try very hard not to allow that to happen. Cattle are often taken out of the paddock when the plants have just been bitten, leaving about 3 inches of plant growth. We allow complete grazing off during certain times, but definitely not during the growing season.

The mineral cycle is closely observed. Manure paddies now decompose in 3 to 4 months. The mineral cycle and microorganism levels in the ground have improved to rapidly decompose the manure.

Plant life is now showing signs of improvement. Sloughs are starting to fill in and other higher succession grasses are becoming established in open areas between brush type plants. Small, narrow-stemmed grasses are growing now that had previously not been present. Old plants with dead centers and only a live outside ring are coming back to life.

Sometimes beneficial changes take place that are not always visible above ground. Root development is checked. Above ground less old plant life may be visible, but below the surface much new root development is taking place. Our paddocks show more roots and more fibrous development compared to an area that is continuously grazed. The continuously grazed land has thick, coarse roots. Ours has that plus many small, thin and long fibers indicating new root development.

We are pleased with the grazing rates and performance we have achieved on Shipwheel grasslands. Our results over the years 1979 to 1986 (which included the drought years) for one cell encompassing 2400 acres of rangeland are presented in table 1. Stocking rates have been maintained at double the carrying capacity recommended by the Department of

Agriculture which was 125 cow-calf pairs. Over the drought years, conception and birth rates have not suffered and weaning weight and average daily gain on pasture have improved.

During this time, we received an average of 7.4 inches precipitation during each growing season, which was less than 44% of the long term average annual precipitation .

Table 1. Grazing and performance results on cell 1 (2400 acres) of Shipwheel Grasslands

Item	Year							
	1979	1980	1981	1982	1983	1984	1985	1986
No. of pastures	6	6	6.17	17	17	17	17	21
No. cows grazed	276	240	250	350	320	236	235	250
Conception (%)	-	92.8	95.0	92.0	92.0	93.0	94.0	95.0
Birth rate (%)	100	97.5	93.8	93.0	95.0	94.6	94.0	94.3
Weaning wt (lb)	410	460	450	387	398	441	345	450
Adjusted 200-day weaning wt (lb)	436	510	497	457	476	532	512	533
Gain on pasture (lb/day)	2.42	2.11	2.06	1.91	1.95	2.35	2.10	2.23
Lbs/acre weaned	46	38	39	45	42	42	20	31
Stock days'acre	29.5	29	29.3	35.4	36.2	27.8	29.4	-
Precipitation during grazing season (in)	4.9	7.5	9.6	7.7	5.1	6.4	10.3	-
Annual prcp.(in)*	12.8	17.5	12.8	15.3	11.8	12.1	-	-

* Long term average annual precipitation of 16.95 inches.

Discussion

Q. In regards to your grazing system and paddock management, how do you analyze the condition of the grass and determine when cattle should be moved?

A. That requires a two part answer. The first is how do we determine when cattle should be moved. That comes back to the concept of timing, that the plant gets overgrazed not by the number of animals in the paddock but by the time the animals are grazing. Essentailly we try to move animals off a paddock when the grasses have been grazed once. We then have to determine the rest period before the paddock gets re-grazed. We actually flag plants within the paddock. During the growing season we find that we have to be moving through rather more quickly. By flagging we can determine whether the grass has had adequate time for regrowth.

The second part is more longterm and involves how we are doing over a period of years. The process we use to evaluate the condition of the range is quite complex and involved. A dart is thrown over the shoulder 100 times from 6 points within a paddock. We have an itemized questionnare to complete that measures a variety of things to determine our longterm progress.

Q. How do you determine the number of paddocks per grazing cell?

A. Production yield curves based on number of paddocks suggests a minimum of 10 or 12. For example, if you were working on a 30 day rest period with 10 paddocks, each paddock would have to be grazed approximately 3 days per month, assuming they are of equal size. With 15 paddocks, you can graze for two days each month. To achieve a 30 day rest period with 6 paddocks, each paddock would have to be grazed about 6 days. A grazing period of 6 days would likely result in plants being browsed more than once. Animals are in so long that they may come back and re-select those plants. There is no set number of paddocks to use. We have 17 paddocks, but would like to have 40 to 45, because it provides so much more flexibility in terms of drought, high rainfall and grazing intervals. There are paddocks in Africa numbering 100 per cell.

Q. What should we do if we want to try this approach to range management and do benefits offset the cost of construction of the cells?

A. It is so important to go through a school because HRM is so complex. Without proper knowledge of how HRM works, rotational grazing would occur, which would result in a short-term improvement of about 15% but would not produce any long-term benefits.

With regards to construction, we hired the construction of the first cell for $15 per acre and doubled the stocking rate. Most ranchers, through their own ingenuity and by using their own material, could easily construct a cell for $7 to 10 per acre. Spraying or ripping up rangeland is far more expensive.

Q. Have you had any experience with seeding grasses or different varieties, and which fit in with your grazing?

A. We used re-seeding before we started HRM. We also tried breaking up and seeding or seeding directly to native range. Now we would not likely ever consider reseeding due to the cost involved. In one of our cells on 275 acres, the old range of low succession plants is slowly going out. Wheat grass and a number of high succession and highly productive species are becoming established. I don't know where they are coming from, but they are coming in without having to do the cost of reseeding. Most often, reseeding is not the place to spent your money in this system. Improved types of grasses will be established by themselves with proper range management.

BREEDING FOR THE FEEDLOT MARKET

John Stewart-Smith
Beefbooster Cattle Limited
Box 1180
Cochrane, Alberta T0L 0W0

Introduction

Our concern today is whether to use breeding to produce better feeder cattle. This decision will be made at the ranch or farm level by the cow-calf producer. He is faced with difficult choices because he has to consider many factors and has a larger array of genes to draw from. Factors that influence his decision will be discussed. Some of the salient features of our industry will be pointed out, as well as some genetic concepts and what can be accomplished by measurement and selection.

Salient Points

The basis of the beef industry is to convert forage into high quality protein food and other valuable by-products. Cattle are the converters which enable this to be done. Unfortunately, or perhaps fortunately, these converters are biological rather than mechanical machines with personalities of their own. Some of the main competitors for the protein dollar are the hog and poultry industries. They have emulated the corn industry and have utilized the genetic potential of their species. The same must be done in the beef industry, even though it will be more difficult to accomplish.

The following gains in beef production are well within reach through genetic improvement:

20% increase in pounds weaned per cow exposed
0.5 pounds per day faster growth
1.0 pounds less feed per lb gain
2% less mortality in feeders
1% higher cutability

Economic Traits

Economic traits that concern cattlemen are listed in table 1 by level of heritability. Until recently the industry had relied almost entirely on pedigrees, shows and sales as the tools with which to improve cattle. All are subjective measurements. A scientific approach using objective measurements such as records of performance may be more effective.

Table 1

ECONOMIC TRAITS

		LEVEL of HERITABILITY
REPRODUCTIVE PERFORMANCE	fertility	L
	calving ease	
MATERNAL PERFORMANCE	survival	M
	milking ability	
	low maintenance	
	growth	
	efficiency of gain	
FEEDER PERFORMANCE	carcass merit	H

L Low
M Moderate
H High

Genetic Opportunity

Dr. R.L. Willham of Iowa State University outlined genetic opportunity relative to beef cattle breeding. He grouped economic traits into 3 main categories (table 2). Twenty percent breed type differences for reproduction means that within breeds, there is a 20% variability among animals in their ability to reproduce. Heritability indicates the amount of progress that can be expected through selection. Economic values refer to the relative importance of each group of traits. At the cow-calf level, it is five times more important to have a live calf than one that grows fast. In the feedlot, it is twice as important to have good performance than high cutability. Putting it all together, it is 10 times more important to have a live calf than high cutability.

The most effective strategy for genetic utilization must be based on exploiting heterosis in the cow via crossbreeding to improve reproductive traits which are of low heritabililty and on utilizing selection to improve the feeder traits with higher heritabilities such as rate of gain, feed conversion efficiency and carcass merit. The variation between breeds and within breeds for different traits can compliment each other.

Although our ultimate production goal is the product beef, carcass merit is relatively unimportant to the commercial cattleman. His main concern is that production per cow be maintained at the highest level possible. To him the birth of a live calf every year is the critical factor.

Table 2 **GENETIC OPPORTUNITY** R.L. Willham

Class of traits	Genetic values			Economic values (relation)	
	Breed types differences* (%)	Heterosis+ (percentage increase)	Heritability‡ (percentage of variation)	Breeding herds§	Market feedlots
Reproduction	20	10	10	5	0
Production	50	5	40	1	2
Product	10	0	50	0	1

Heterosis

Heterosis or hybrid vigor is a phenomenon present in the offspring when unrelated individuals are mated. Referred to as an F1 hybrid this offspring has been shown to exhibit greater fertililty as well as viability and modest increases in milk production and growth.

Crossbreeding for Heterosis

Results from crossing Hereford, Angus and Shorthorn cattle indicated that heterosis increased pounds of calf weaned per cow exposed to breeding by 23% (table 3). Part of this increase (8.5%) was due to improved calf survival from birth to weaning along with the increased weaning weights of the crossbred calves. With crossbred cows a further 14.6% increase was realized, due to greater first service conception and heavier weaning weights because of increased milk production and less death losses.

Crossbreeding for Complementarity

By using strains which will complement the weak traits in existing herds, further increased can be realized. For example, one may use a maternal strain to increase milking ability in replacement heifers, or use a terminal strain to produce more growth in feeder calves.

The research data and genetic principles cited indicate that selection combined with heterosis is the most effective strategy to exploit the genetic potential in cattle.

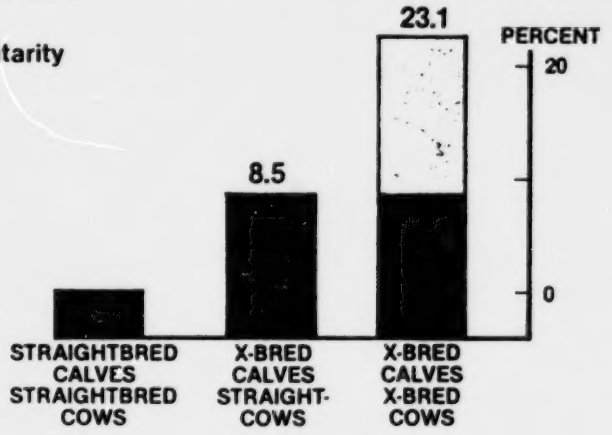
Distinct types of cattle need to be developed, each with a specific function to perform in a crossbreeding plan. Before a breeding program is started, objectives must be established. If you don't know where you're going, it doesn't matter what road you take. These cattle need to be selected for the primary traits which most closely indicate the function to be performed, that is growth (average daily gain) and maternal performance (weaning weight of the calf). Many objective measurements can be taken, the most important of which is weight.

Table 3

CROSS-BREED
for Heterosis and Complementarity

with
PERFORMANCE SELECTED
SEEDSTOCK

Best opportunity of ulitizing genetic potential in cattle for beef production.



Source: USDA MARC Nebraska.

Selection

Selection is defined as a process in which certain individuals in a population are preferred to others to produce the next generation. It is the only tool we currently have to influence production. Selection means the producer decides which animals will be the parents of the next generation. New genes are not created by selection. Under selection pressure the frequency of the more desirable genes is increased and the frequency of the undesirable genes is reduced. The main effect of selection is to change gene frequencies. It is also the only directional force available to the cattle breeder in developing functionally superior seedstock. The response a breeder gets from selection depends upon the accuracy with which he identifies his superior bulls, how few he uses and the variation within the herd which he is selecting.

There are various methods of selection available: 1) pedigree or ancestry, 2) family 3) individual performance and 4) progeny. Selection based on the performance of progeny is the most accurate, but the most time consuming. Selection based on individual performance is the most often used. The performance of individual bulls is approximately 40% repeatable. A bull will pass on about 40% of its superiority to its progeny. Progeny tests take about 5 years, but reveal exactly what a superior bull will transmit to its offspring. Pedigree and family selection are very weak methods. A grandparent is a poor indicator of what a bull's progeny will do.

There are also various types of selection: 1) one trait at a time, 2) two or more traits together, 3) independent culling levels and 4) selection indexes. Selecting for one trait at a time is nearly impossible, because beef animals are too complex. Selecting for two or more traits together means some compromise must be made. The use of independent culling levels infers that an animal will be culled if it fails to meet a standard in one trait, regardless of other

merit. This type of selection is often used for scrotal circumference. Selection indexes which define and weight the important economic traits are probably the most precise and are now easier to develop with the computer technology available.

Dr. D.D. Kress of Montana State University, when selecting for a number of different traits, measured genetic progress per generation based on using the top 4% of the males and the top 50% of the females in a herd (table 4). Generation interval was approximately 5 years. As was expected, the greatest progress was made in the trait to which selection pressure was applied, but there was at the same time a response in all other traits. Mature weight increased less when weaning weight was selected for than when yearling weight was selected. Mature weight increased the least when post weaning gain was the selected trait. Improvements in other traits increased birth weights.

Annual progress made through selection is a function of the heritability of the trait, the selection differential (difference between average of selected individuals and average of entire herd) and the generation interval.

Table 4 **GENETIC PROGRESS PER GENERATION, IN LBS.**

Trait Selected	Birth Weight	Weaning Weight	Post Weaning Gain	Yearling Weight	Mature Weight
Birth Weight	5.4	15	15	29	40
Weaning Weight	2.6	21	12	29	28
Post Weaning Gain	3.2	15	28	41	23
Yearling Weight	3.7	21	24	48	42
Mature Weight	3.8	15	10	32	69

D.D. Kress

Implementation of Genetic Principles

The cow-calf producer makes the breeding decisions. He must first strike a balance between fertility and growth. These two traits are antagonistic. Bigger, faster growing cattle tend to mature slower sexually, to be less fertile and have more calving difficulty.

The calf producer must next raise cattle that are suited to his own environment, mainly with regard to the plain of nutrition that is available and to some extent with regard to the climatic factors existing on his property.

He must then develop a breeding plan for his operation which exploits both heterosis and complementarity, bearing in mind that almost half his herd must be assigned to producing replacements. If a producer has a 100 cow herd, at the very least 45 of these cows need to be used to produce replacements. One could expect these 45 cows to produce 20 heifers, of which perhaps 15 to 18 will be useful. Other management factors that will affect his breeding plan are how many breeding pastures are availabe, how intensively he intends to manage the herd and how he intends to market the offspring. That is why there is no one universal breeding plan. Breeding plans must be custom designed for each situation, but should be designed with the following objectives: 1) to replenish the herd with crossbred females, 2) to produce faster growing calves and 3) to minimize calving difficulties.

A study of the various cross-breeding systems that are available will show that four types of cattle are required, namely bulls for heifers, maternal, terminal and all-purpose strains with at least two distinct strains of the maternal type. Thus a minimum five strains of cattle are required to be able to implement all the various cross breeding plans that can be devised. That is not to say that all five or more strains must be used. Some of the benefits of crossbreeding can be obtained using just two strains, but only about 66% of the available heterosis will be sustained in the herd.

The most popular type of plan uses three strains. It is called the COBBETY system. The name was derived from the first letters of the words Changing Over the Bull Battery Every Three to five Years. It can sustain about 80% of the theoretical hybrid vigor in a herd.

This basic plan can be improved by using maternal type bulls on the younger portion of the herd to produce replacement females and by using terminal type bulls on the older cows to produce feeders. Essentially a 45:55 split is established. A cobbety is done on the young females and male calves are marketed. A disadvantage is that heifers cannot be selected from the entire calf crop, just the maternal side. A possible advantage is that the maternal strains can be managed separately. Dairymen would never fatten heifers because the udder is ruined on a high plane of nutrition. Similarly, some high producing cows can ruin a heifer calf before it is weaned. Separate feeding programs could alleviate this problem.

A further enhancement to such a plan is to use bulls with light birth weights on the yearling heifers. The assumption that birth weight is contributed 50:50 by the dam and bull is wrong. Genetically it may be true, but the dam has far greater influence through the prenatal environment it provides the developing calf. Using a bull with light birth weights may be just enough to prevent possible calving difficulties. Natural births and cows that calve every year and conceive in a 50 day breeding season (2 cycles) must be strived for.

The next thing to consider is the selection strategy for developing the kinds of cattle that the rancher will require to implement his breeding plan.

The only justification for keeping a single-purpose beef cow is that she utilizes grains and forages that cannot be used more profitably in the production of high quality protein. Due to the structure of our industry, bulls and replacement cattle are produced under hot house conditions on high levels of nutrition and are then expected to perform as well out on the range.

Maternal bulls should be chosen from the bulls that had the highest weaning weights out of the best cows. Bulls selected as terminal sires are used in the final cross to produce feeder animals. This selection should include the performance of bulls' progeny on grass as well as during the finishing period. Terminal sires should be chosen from among those that gain the fastest and carry a minimum amount of fat over an extended period of time. Putting bulls on feed for 120 or 140 days reveals nothing. Bulls should be fed for an extended period of time to test their durability. Leaness is desired in terminal sires to counteract the ability of maternal strains to fatten, which is required in order that they can withstand our environments.

If specialty cattle do not fit into the nature of an operation, all-purpose animals that combine maternal and paternal characteristics should be used. They should be selected on a basis of yearling weight which combines both maternal and paternal traits.

Breeding Soundness

Having good traits in your animals is of no use if they cannot be transmitted to the next generation. Bulls should be evaluated for breeding soundness. Imagine inspecting an army tank for the folliwng criteria: 1) Is the gun in working condition? Can it fire? 2) Is it firing blanks or real bullets? 3) Are the spindle and tracks in good shape so the tank can get around the battle field? and 4) Is the crew ready and willing to go into battle?

Veterinarians examine bulls and perform tests to answer the first three questions. A libido test answers the last question. Meaningful libido tests are difficult to design due to the great variability in libido among bulls.

Muscling or Cutability

Muscling is an important trait to the butcher. There may be even more variability in this trait than what was suggested by Dr. Willham. Unfortunately the way our market is structured at present, no signals reach the cow-calf man and only a faint signal regarding cutability reaches the feeder. Another problem is that higher muscled, bigger animals tend to be less fertile. Little attention is paid to improving cutability by increasing the amount of actual lean. Most effort is directed at reducing the percent of fat. Agriculture Canada through its Blue Tag Service supplies breeders with a very good tool they can use to measure and select for better cutability.

Uniformity

Uniformity is a word that is used loosely and bandied about frequently by cattle people. It usually refers to colour, size and condition but contains an inference to quality and performance. In reality, there is no such thing as a uniform group of cattle for the economic traits such as growth. The performance of any group will be distributed with usual probability as illustrated by the common 'bell curve'. The shape of the curve is all that can be influenced. Through selection we try to alter the shape of the curve and move the curve to the right.

Hair Colour

Hair colour is widely used in the industry as a brandmark. Hair colour is not an attribute of beef quality nor is it an accurate indicator of economic traits such as growth. Although it is unreliable, it is convenient and is the traditional way of distinguishing cattle. Cost conscious cattlemen should substitute factual performance data whenever possible.

Retained Ownership

Any cattleman who takes the trouble to produce superior cattle along the lines I have described should keep possession of them as long as possible so that he can realize the profit potential in them. He can avoid the discrimination in the market place against cattle which are multicoloured and variable in size although they are functionally efficient. He can spread the price risk due to seasonal market fluctuation. He can extend and improve the return on his investment. There are five ways or any combination of them to retain ownership:

1. Selling backgrounded cattle
2. Selling short keeps
3. Custom feeding backgrounded cattle or short keeps
4. Feeding backgrounded cattle or short keeps at home
5. Easing your way into retained ownership by keeping a greater percentage each year

Selling calves straight off the cow is a common practice but is probably the poorest way that a cow-calf operator can market his product.

General Comments

The beef industry presently does not require that a uniform product be produced. The efficiency and flexibility of our beef marketing system is astounding in its ability to market any type of product produced.

Genetic improvement is not a quick fix, but a long term business. It takes 2 to 4 years to see improvements in slaughter calves after a breeding program has been initiated. Changes in a cow herd will not be visible for 8 to 10 years, unless replacement stock is purchased. Seedstock producers must adhere to a consistent breeding plan for 15 to 20 years before any significant improvement is seen. However, genetic improvement is permanent, accumulative and can be transmitted to future generations.

Recent reports from Statistics Canada indicated that 78% of the calves produced in Canada are from herds of less than 100 cows. Producers with less than 100 cows seldom make a living solely on their cattle operation. Of the 22% of the calves from herds of over 100 cows, 16% are the product of 100-200 cow herds and 5% are from 200-400 cow herds. Less than 1% of the calves produced in Canada are from herds of over 400 cows. Because of this structure, it is doubtful that our industry can harvest the genetic potential in our species to its fullest. The feedlot market will have very little effect on the breeding strategies of these small herds and their side line purposes of cleaning up coolies and by-products of other enterprises.

Conclusion

Despite the somewhat negative attitude regarding the prospect of our industry utilizing the genetic potential in our species to the extent it could and despite the decline in consumption and difficulties we have experienced, the beef industry has a future. Besides countering the bad press we have had, doing innovative product development to suit consumer needs and continuing to take up the slack and inefficiency in our whole production and marketing chain, we have two big advantages over our competitors: 1) Beef cattle are ruminants and as such 80% of their nutrition is provided by grass and forage and 2) Beef production is less intensive than other livestocks or poultry enterprises. Restrictions on the use of antibiotics and hormones due to fears of food pollution will have a lesser impact. Our industry will be able to compete better in a situation where antibiotics and hormones cannot be relied on.

Discussion

Q. For producers who want to upgrade the genetics in their herds, are they better off going with a purebred bull or one based on a 6-way cross that has a compliment of everything?

A. Any genetic improvement you make in a herd is about 80% dependent on the bull(s) you use. I would be wary if producers just looked on the cow side. If you don't keep your base cows going, you will get into trouble. As far as whether to use a purebred or crossbred bull, I think the question you have to ask is a purebred for what? Most of the bulls we call purebred are purebred for color and very little else. Regardless of purebred or crossbred, you need a bull that has been consistently selected for the traits or trait you are looking for, based on performance records. Performance test stations have been used as marketing tools, not as genetic improvement tools. Bulls are put into performance test stations and are usually all sold. Few have been taken back home. These producers usually select what they consider are the superior bulls they want for breeding stock and send second rate bulls to test stations for marketing purposes. You have to find a breeder who tests all his bulls for particular traits and does so consistently whether his animals are purebred or crossbred. If he's not doing that, he's not doing his job. It doesn't matter what the bull is, as long as it is has been consistently performance selected over a period of time for what you are looking for.

You must also distinguish, not between purebred and commercial herds, but between seedstock producers and commercial beef producers. Purebred breeders can be excellent seedstock producers and most are. But an excellent commercial cattleman may also be a topnotch seedstock producer.

Q. What does a replacement heifer actually cost from the time she is born until she drops her first calf?

A. A lot of money, but I don't know of any other way that I can get her consistently. For what I'm breeding for in my herd, I know exactly what I've got, within the biological limits.

Q. How long does it take to recover the cost of that heifer?

A. What will it cost to buy her from someone else? What is your alternative? I think the cost of that heifer is what you could get for her on the market. That is your comparative cost. The worth of a replacement heifer must be considered in terms of a cycle of about 12 years. Right now, bred heifers are worth a premium.

Q. What figures can we give the commercial cattlemen? An argument we often get from them is that they keep the figures but don't show them to anyone because no one is interested. What should they have available?

A. A commercial cattlemen doesn't have to be interested in figures. What he should be interested in is whether the seedstock producer is using the figures. General Motors do not reveal the alloy they it use in their engine blocks. Do you care? You know GM has a staff of scientists that pays strict attention to the figures. That is the point. A seedstock producer must use the figures and tell you how he used them. Which cows were culled, which bulls were kept? If he can't show you that and if you are not happy that he is using performance selection, that man is bluffing you and he isn't a seedstock producer. Figures mean nothing if the producer you're buying from isn't using the figures himself. Figures then are just a merchandizing tool.

Q. In regards to Lasiter's philosophy of breeding, does he base selection on the population rather than individual animals?

A. Selection must be based on the population but still has to identify and determine the performance of the individuals.

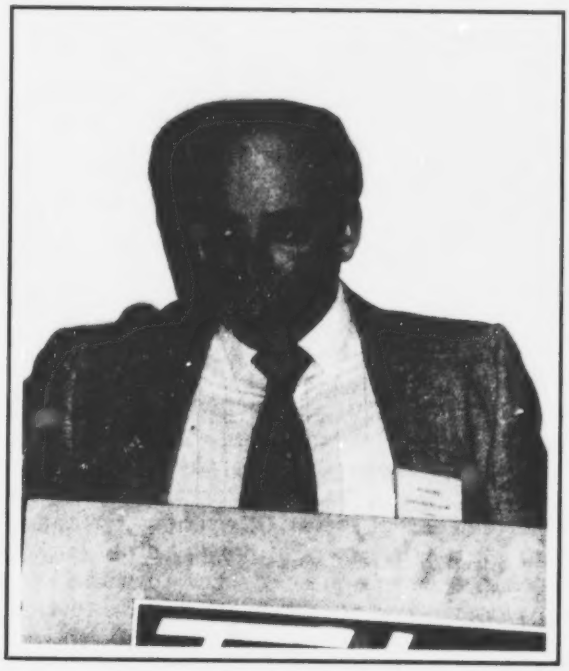
Q. But doesn't he pick a group rather than individuals?

A. No. How can he? He doesn't turn all his bulls out to breed all his heifers. As soon as he makes the distinction to cull an animal, he identifies an individual. The only difference is that the entire herd is not built on one individual. It has no 'best cow', but have a number of them.

Q. What about the effect of increasing calving difficulty through selection for 200-day weight?

A. Since exotics were introduced and all the horror stories about difficult calvings arose, we have selected a cow that is geneticaly capable of giving birth to a larger calf. But increasing size is something we have to watch in the long run because this capability will plateau eventually.

INFORMATION OBTAINED ON RETAINED OWNERSHIP



Jim Armstrong
Livestock Specialist
Saskatchewan Agriculture
Tisdale, Sask.

Twenty percent of all feeder calves produced likely come from cows that should have been culled. Retained ownership can not only increase the profitability of a farm but also provide an opportunity for herd improvement. Data presented in this report were collected from a feedlot owned by Josh Storey and a cooperating feeder. A project was undertaken to determine whether through retained ownership performance of the cow herd and performance of the calves in the feedlot could be improved. As well, the profitability of retaining ownership of the cattle until finished was determined.

When calves are weaned onto a truck and to the sale yards, many opportunities of herd improvement are often lost. Individual calf weights are seldom provided as most times calves are sold as groups. With no knowledge of what individual calves weigh, individual cow productivity cannot be measured. Cow-calf producers tend to forget that there were some cows in their herds that did not produce so well. Their incentive to cull is much diminished. Another problem has been that the calves produced on farms generally end up going into feedlots that do not provide any feedback to the calf producer on how well calves gained in the feedlot, how well they converted and what kinds of carcasses they produced. Retained ownership would give producers an opportunity to acquire measurements of the performance of their own cattle in the feedlot. Since the beef stabilization program was introduced, there are many more producers feeding out their calves at home or in custom feedlots. That, through the information provided, is having positive effects on the cow herds involved. Retained ownership could have the same positive effects.

The effect of culling on the basis of adjusted 200-day weaning weight was considered. The producer had a group of 58 calves with an average adjusted 200-day weaning weight of 509 pounds. Adjusted 200-day weights were used because they remove some of the variability in weights due to the age of the calves and not so much related to the productivity of the cows per se. Had the producer selected only calves with an adjusted weaning weight of 475 pounds, the average weaning weight of the selected group of 43 calves would have been 530 pounds. The key point was that the producer had objective, individual measurements and a sound basis for selection. The improvement in adjusted 200-day weight per generation would not be as great as the 21 pound difference in weaning weight because only a portion of that difference is heritable and can be transmitted to the next generation. The fact that the producer had production information available on which to base his culling decisions was the important key provided when he retained the ownership of his calves.

Average pre-weaning daily gain of the entire group of 58 calves was 2.06 lb/day. The 43 selected calves gained 2.2 lb/day before weaning. Backgrounding gain of the entire group was 2.43 lb/day. In this case, the producer backgrounded his calves on the farm after weaning and then finished them in a custom feedlot. The backgrounding gain was 2.33 lb/day for the group of 43 selected calves. The decrease in backgrounding gain suggested that some calves in the entire group were not getting adequate nutrition while on the cows. They had the genetic potential to produce but their dams could not supply enough milk for them to reach their potential for growth. When the calves went into the backgrounding situation and received adequate nutrition after weaning, compensatory gains likely occurred and increased the average backgrounding gain compared to that of the selected calves.

The feedlot in-weight averaged 879 lbs. The cattle finished at just over 1200 lbs, producing a daily feedlot gain of 3.57 lb. If a higher 200-day adjusted weight was selected for, feedlot weight would also have increased but would have remained within the market standards. Average feedlot gain of the selected group was similar to the entire group. The genetic potential of this herd to perform in the feedlot was very good. By the time the finishing period was reached, the calves that were short of milk or had poor mothers caught up to the average of the herd.

With individual 200-day weights available, the producer has been able to cull some of his less suitable cows. Gain in the feedlot was a reflection of the inherent growth of the animals in his herd. The custom feedlot was equipped to provide the producer with measurements that estimated the growth potential in his herd.

Rail grading is another system that provides measurements of economic traits to producers using a custom feedlot and in particular to those who retain the ownership of their cattle. Rail grading provides a reflection of what their calves have done all the way through to the final product. The profile of carcass weights of this particular group of calves was fairly good. Three carcasses weighed less than 565 pounds, 46 weighed between 565 and 721 pounds which, according to packing plants, is the ideal weight range and 9 weighed over 721 pounds. Although the carcass profile was good, animals that produced carcasses weighing more than 721 pounds may have been on a finishing ration too long and could have been marketed sooner. If the number of heavy carcasses persisted, the producer could consider changing the finishing ration or omitting the backgrounding portion of his program. Animals could be placed directly into a finishing program to finish in the ideal weight range.

This producer made one major change following the the first year he finished his own cattle. The first year he was finishing calves that had been grassed. The grassers went into the feedlot in December and were marketed in March of the following year. He found that he was getting some particularly good feedlot animals but of the calves he had at home, some were starting to look a little too big to go to grass. He now takes his calves directly into the feedlot program and his carcass weights and grades are similar to those of animals that were backgrounded on grass before going into the feedlot. He has effectively shortened up his finishing period by 4 to 5 months and is getting the same kind of carcass value. His cash flow is improved because he is getting his money out of his cattle sooner than when he grassed them.

The calves did not all finish at the same time. Of a group of 63 calves that entered the feedlot, 10 finished after 61 days on feed, 2 after 75 days, 10 after 88 days, 24 after 109 days and 15 finished after 122 days on feed. This normal distribution in number of days to finish may be significant to producers who are deciding whether to feed their calves at home or in a custom feedlot. If a producer feeds his calves at home, only a small number of cattle will be ready for market at any one time and will likely be assembled with other animals. Producers are therefore limited to the markets they have access to and have very little selling power. Feedlots have greater market accessability, sort cattle on a regular basis, have loads of cattle finishing every week and have more control over the selling process. A producer has to balance some of his reduced return against keeping his cattle at home and being able to benefit from the use of his own labour and feed resources. In terms of marketing and getting the maximum dollar for cattle, a feedlot can offer some advantage.

Feedlot performance figures were obtained for two groups of cattle finished in the feedlot (table 1). The calves were the progeny of Brown Swiss Hereford cross cows bred to Angus or Charolais bulls. This producer used organized crossbreeding and had a plan to produce beef on his farm. The cattle were finished on a combination of barley silage, barley grain and required supplements.

Table 1. Feedlot Performance of Brown Swiss-Herford X Charolais or Angus Steer Calves.

Trait	Finishing Period Mar-Sept '85	April-Aug 86
Cost/day	$1.89	$1.64
Cost/lb gain	$.57	$.47
Feed:gain	-	7.1
ADG (lb)	3.32	3.48
Total gain(lb)	408	404
Days on feed	123	116

To determine the profitability of retaining ownership of calves, alternatives must first be considered. A group of calves could have been sold in November, 1984 (table 2). The market prices for 925 pound steers and 828 pound heifers was 78 and 74 cents. Instead, the calves went into the feedlot in November and were marketed as finished cattle in April, 1985. Feedlot costs included feed, care, vet fees and yardage. Interest was attributed to what could have been earned had the producer sold his calves and put the money in the bank. Marketing costs included freight, Hartford insurance and brand fees. Total costs were approximately $71000 when the value of the feeders was included. Actual market returns on these finished animals were $68,370. Stabilization payments were $5430. This producer realized an extra $3160 or $42 per head by feeding out his cattle.

Returns to retained ownership of a group of calves fed out from April to August of 1986 are presented in table 3. All figures except stabilization payment were actual. Stabilization payment was estimated because actual returns had not been established for that particular quarter. Over the groups of cattle this producer fed out, returns ranged from about $36 to $45 per head gain by retaining ownership.

Retained ownership can increase returns to beef producers. It can improve the beef herds in Saskatchewan with the cooperation of feedlot operators. They may be required to take an extra step to individually weigh cattle and provide that information to producers. This information feedback system could be the role played by feedlot operators to develop the type of cattle they want in their feedlots.

Table 2. Returns to retained ownership Nov 84 to April 85

Value of feeders:		
48 steers @ 925 lb @ $.78=		$34630
27 heifers @ 828 lb @ $.74=		$16540
Less marketing costs		1500
		$49670
Feedlot costs	$14100	
Interest	1260	
Stabilization levy	4340	
Marketing	1270	
	$20970	$20970
Total costs		$70640
Market returns	$68370	
Stabilization payment	5430	
	$73800	$73800
Less: total costs		70640
Net return to feeding		3160
OR $42 per head		

Table 3. Returns to retained ownership April-Aug 1986

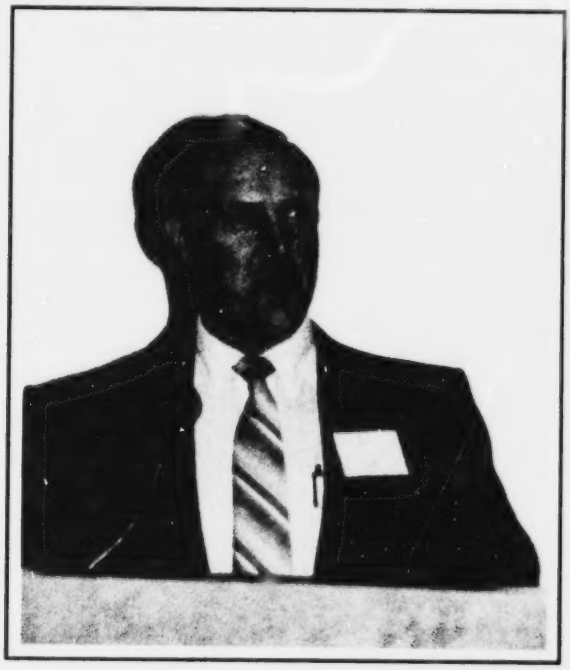
Value of feeders:		
60 steers @ 850 lb @ $.78=		$39780
23 heifers @ 760 lb @ $.71=		12410
		$52190
Less marketing costs		1650
		$50540
Feedlot costs	$14620	
Interest	1400	
Stabilization levy	3660	
Marketing	1800	
	$21480	$21480
Total costs		$72020
Market returns	$61050	
Stabilization payment	13970	
	$75020	$75020
Less: total costs		72020
Net return to feeding		$ 3000
OR $36 per head		

Discussion

Q. Won't selecting for 200-day weight increase calving problems?

A. It can. Anytime you select for growth, you have to keep in mind that as animals get larger you may have some problems. Selecting for 200 day weight will simultaneously increase birth weight. If you have the proper management to go with it, you won't have a problem. But calving ease must also be selected for. Selecting for weight alone is not the answer.

SELECTING FEEDERS



Ray Baird, Manager
Clavelle Farms Limited
Viscount, Sask.

The ideal situation in feeding cattle is to buy low and sell high to make a profit. This is not always possible so other factors must be considered. Regardless, a feeder should always ensure that all facilities, information and expertise on hand are utilized.

Each situation must be analyzed as to whether it is a once-a-year venture or a year round business. If cattle are purchased at only one time during the year, it becomes more important to get good quality cattle at the right price. If cattle are purchased on a year round basis, that risk factor can be spread out. Certain forces dictate cattle prices and must be contended with when buying cattle. The market is saturated with calves in the fall as tradition seems to dictate. Factors such as weather, tax dollars at year end and cattle coming off grass should also be considered.

Feeders must decide whether to purchase steers or heifers. Heifers quite often require more feed to finish and are sometimes less efficient than steers. Heifers can be bought at a lower price than steers but are also worth less when they are marketed. Pregnant heifers require more management. If MGA or other heat suppressants are not used on open heifers they will display estrous activity during the feeding period.

When lots of cattle are being set up, uniformity should be strived for. A group of cattle of similar weights and finish can be merchandized better than a group of cattle made up of a wide range of weights. Packing plants like to have cattle the same size because they have often already made these sales.

Purchases should be planned according to feed and facilities available. If roughage is plentiful smaller framed calves can be purchased that require growing out. If roughage is in short supply, bigger cattle or short keeps should be purchased and fed out on higher grain rations. Uniformity comes into play once this decision is made. Purchase all small framed calves or all large framed calves. If small and large framed cattle are mixed and fed a growing ration it will be difficult to finish the larger framed animals that did not require growing out.

If good facilities such as sheds are available and management is not limited, calves should be bought. Cattle sheds must be managed properly. If they get too hot, the warming and cooling effect on cattle can create health problems. If such facilites are not available yearlings should be purchased as they can better withstand the extremes of the environment. An important part of buying yearlings is to ensure they have enough growth potential left that money won't be lost by feeding them out. If a high price is paid for cattle coming in at 800 to 850 pounds, they should be capable of gaining another 400 pounds. No money can be made today on the buying-selling price differential. Any profit must be made on pounds gained. If cattle are bought at 800 pounds and finish at 1000 pounds there isn't a lot of room to breakeven.

If cattle are to be custom fed, check with the feedlot operator as to what type of program he has. Most feedlots are equipped to feed any type of cattle.

Different buying systems can be used. You can buy cattle yourself or cattle buyers can be commissioned to purchase for you. It is important that you be specific with your buyers when you give them an order. If a price is stated, it should be clear as to whether it is the top or bottom price you're willing to pay. Care must be taken to ensure that there are not a lot of calves bought to cheapen the load, such as poor performers or animals that are hard to handle. If a top dollar is paid, expect top quality cattle coming into the feedlot.

Genetic ability is important. It is difficult to judge performance potential by appearance. Colors are often used in selecting feeder cattle, but do not necessarily indicate potential performance. Hopefully there will be more information coming out on the background of cattle through retained ownership. Of course, if retained ownership becomes widely practiced, then there will be no reason to worry about buying cattle. But hopefully the feeder industry will come out in the middle and receive background information on purchased cattle as well as custom feed cattle in retained ownership.

SELECTION OF FINISHED CATTLE

Dennis Wobeser, Owner & Manager
Hi-Gain Feedlot
Lloydminster, Sask.

The topic given to me was the selection of finished cattle. My first thought was that I feel a little out of place talking about finished cattle in a province that promotes rail grading and allows the packer to select finished cattle. Both rail-grading and live selling have important roles to play. In this business of marketing fat cattle, I am proud to be part of an industry that still leaves the marketing decisions to the individual. Agriculture all over the world faces a severe problem. In Western Canada we have zeroed in on a grain growing industry to produce a marketable product. This has been going on since the settlement of the two sister provinces, Saskatchewan and Alberta. People were brought into Saskatchewan to grow grain. The first settlements in Alberta were established by people driving up herds of cattle from the United States to take advantage of the good grazing conditions in southern Alberta.

Those two starting points have remained over the years. Everything done economically, technically and politically has been geared to those two ends. Saskatchewan has put a tremendous onus on the production of grain for export, unknowingly perhaps to the detriment of the cattle industry. The economy of Western Canadian agriculture is now primarily based on grain growing because of two reasons.

The Canadian Wheat Board is the first reason. The Canadian Wheat Board was set up and was very beneficial to the grain growers of Western Canada. Over time that institution was allowed to become an overbearing bureaucracy answerable to no one. It virtually took the marketing aspect out of the hands of the farmer to the point where he is no longer market conscious.

The second factor was the Crow Rate Grain Shipment Pro rate. When the Crow rate started to become a subsidy for grain export, it deterred any diversified production to the extent that if a Western Canadian farmer grew anything other than designated crops, he was fighting an uphill battle. The more the Crow became a subsidy, the more prominent that deterrent became. During the 70's when the economy was thriving and processing plants should have been built to add value to the products grown, they weren't. Producers were locked into the idea that the best return was on growing something that received the benefit of the Crow rate.

Our economy is now at the point where the affluence and money are not available with which to build any value-adding processing plants. We are limited to growing a grain crop to sell to someone that either does not want it or cannot afford to buy it. This problem will not be easily or quickly remedied.

Many of you went through the grain sickness period that began in 1968 when the barley grower feedlots were built throughout this province. A similar situation is developing now with one distinct difference. The liquidity problem is considerably worse on the farm today that it was then.

This preamble was to stress the importance of cattle marketing still being in the hands of the producer. It will be an important aspect of the survival of the beef industry. I caution people about anything that takes away that individual freedom to retain control of the product they sell. There are many programs to supposedly better the financial positions of farmers, but when you get involved in these programs, think of the statement made earlier by John Stewart Smith, "If it isn't real, it won't work". This rationalization must and will take place.

The very recent announcement that the United States passed a bill through congress to investigate the Canadian beef industry will have long-term ramifications on our industry. The US also investigated our pork and soft wood industries. Their justification for a tariff against hogs included small items such as our ROP program and a small subsidy program for hog production in Newfoundland. We as beef producers know very well that the Americans already know that there are more programs they could put on their list about our present beef industry than there were in the hog industry. It is a fear and a caution that we may have some problems regarding the exportation of cattle to the US. Unfortunately, if and when these things happen, the psychological effect will be greater than the real effect on dropping our market. We very much need the access to move our cattle freely both north and south and in both directions. We were recently successful in having the health regulations relaxed on feeder cattle coming into Canada. That is a balance of trade, a free flow of cattle, that we need. It is closer for Western Canada to ship fat cattle to California than to Montreal. It is also closer to ship cattle from the midwestern USA to Montreal than from Calgary to Montreal. Just as such shipments are starting to occur, these potential barriers are coming up.

The previously mentioned things were a preamble to the actual marketing of fat cattle. The most important thing in selecting finished cattle is knowing the market. Producers often say that no one wants to buy the cattle they have to sell. They are not paying enough attention to what people want and too many times find themselves instead trying to tell the purchaser what he should have. That does not work. Too often people in the cattle business get wrapped up thinking that they know what is best for the consumer. That's the wrong

way around. Producers must determine what the consumer wants. In other words, producers must know the market. This goes right back to the time calves are selected. The pattern of marketing cattle is cyclical. At certain times of the year when cattle are short, producers can get away with selling heavy or light animals. But when cattle from the spring feeding period are marketed, the majority being in the ideal weight range, a discount for putting light-weight cattle onto the market can be expected. The packers and retailers should be complimented for doing an excellent job of merchandizing the various types of finished cattle we market. As an industry, we must understand what the market wants, what is going to be readily acceptable at various times during the year, and then try to finish towards that.

The most important aspect of marketing or selecting finished cattle is to know your market and to stand behind your product. In our operation we have stayed with the traditional live selling of finished cattle. We have enjoyed our 'partnership' with the packer-buyers, but feel remiss for not spending time talking to retailers to determine their requirements. In the cattle business, there is an old adage that the sector that pays you, be it order buyers, auction market, feedlot or packer, is the bad guy. As producers we must think beyond that to realize they are as important as we are. In the cattle feeding industry, we are just a service industry. We provide the service of combining a grassed animal and feed ingredients to supply a finished product to the market. We are one part of a little chain in the circle. For an industry to be profitable, each segment of that chain has to function properly and profit in itself. We at times accuse the retailer of taking a little more than his share. However, retailing is a complex procedure, involving numerous items, each having its cost, markup and consumer appeal. How the retailer puts that all together and sells all his product is intriguing. If you know the market and know your cattle, then selecting fat cattle to sell at any time is relatively easy.

Stand behind your cattle. Do everything you can to see that the cattle fit the bill as you describe them. Don't misrepresent them.

After shipping a number of cattle to the American market over the last few years, I am concerned about the Canadian beef grading system. Our industry wanted a grading system to classify cattle and requested that the government bureaucracy design it. The grading system was never meant to price cattle, it was meant to define cattle . By defining, we opened the door for pricing. Our grading system contains numerous splits that invited the retailer and packer to put price differentials on those splits. Price differentials are never up, they are always off.

When a load of cattle is rail graded in Canada, the returns contain in the range of 6 to 9 different splits. If the same load were sold on the US market, only one possible split between good and choice could occur. American packers and retailers seem to be able to merchandise a wider range of weight categories than we can. I question the need for the various categories our system has. A US packer buyer once told me that we in Canada do not have a quality grade. He may have had a point. Our quality grade is really only the A,B or C. The C grade is age, B1 is an A that isn't finished and the B2 is a dark cutter. All are the result of management problems. In essence, all the cattle we feed at a young age really belong in the A grade, and perhaps we do not have a quality split. In the US and Japan, the quality split between choice and good depends on marbling. The Canadian system chose not to include marbling.

If we are going to survive in the North American market, we must be conscious of what others consider good beef.

Packer-buyers want acceptable weight ranges, not off-grades. Even though we consider a well fed heiferette to be terrific meat, she is usually discounted to a B1 or C1 because the packer-buyers have a limited market for those off-grade carcasses. It could be profitable to select good quality C1 carcasses and merchandize them as freezer beef. However, that is too small a part of the entire market to have any impact on the price of C1 carcasses.

In normal day-to-day operation, selecting fat cattle comes back to cattle with the finish, yield and weight category desired by the packer.

Discussion

Q. How do you produce the marbling that the American or Japanese markets want?

A. Marbling depends on breed, days on feed and fat cover. Excess outside fat cover does not necessarily mean a carcass will be marbled, but increases the chance of it being so. Early maturing cattle such as the traditional British breeds that reach mature growth size at an earlier age will start marbling sooner than late-maturing cattle. If you are feeding for the American market, you must feed to a fat category higher that you would in Canada, which means some animals would grade A3. An extra 20 to 30 days of feeding would be required. Once you've made the decision to feed for the American market you must sell there because you are beyond the fat range acceptable to the Canadian market.

The American market is now going to leaner beef. Beef trade in the US tried to change their grading system but were unsuccessful. However, as an industry they are doing so. The change to leaner beef was brought about by boxing. Some plants box every carcass that goes in. Our definition of yield is pounds of carcass out of pounds of live animal. Yield increases with time on feed due to increased fat cover. Yield of boxed beef is somewhat different because unnecessary fat must be trimmed. Leaner animals produce the highest box yield. The American system is rapidly changing to leaner beef. Fortunately for us, we lead the way in leaner cattle.

Q. I cannot imagine going back to a system that would create fatter cattle again when we have to compete against leaner meat now for sales. Only with lean beef can we compete against fish and poultry.

A. That is 100% correct. We lead the way in leaner carcasses and the US followed. But the US concentrated in getting marbling into leaner carcasses, through breeding, etc. Lean is an avenue we want to go. Lean is currently popular because of the cholestrol fad. I'm not certain it will last over time. I also don't think we should ever get too lean. In North America, we have become known for the production of quality eating meat because it was grain fed. That started by chance in this part of the country when we found it was cheaper to feed the cattle grain than roughage, simply because of the fact that as soon as you fed grain, the gain per day went up and both the cost per lb per day gain and the overhead cost came down. It is now what sells our product. We must not lose sight of that because there are many countries in the world such as Australia, Argentina and Africa that can produce grass fed lean beef much cheaper than we can and could blow us right out of the market.

Q. Some A1 carcasses are tough. Do you agree?

A. I would tend to agree if animals are marketed at too low a level of actual change in fleshing. Toughness could occur on the leaner end of the A1 grade compared with the A2 grade or higher. I would think that the inconsistency of cuts is more of a problem than toughness. That has probably hurt our consumption considerably in comparison to the fried chicken that is perfectly consistent day in and day out for the housewife who knows less today about the proper preparation of meat for the table than her mother did.

Comment by John Stewart-Smith:

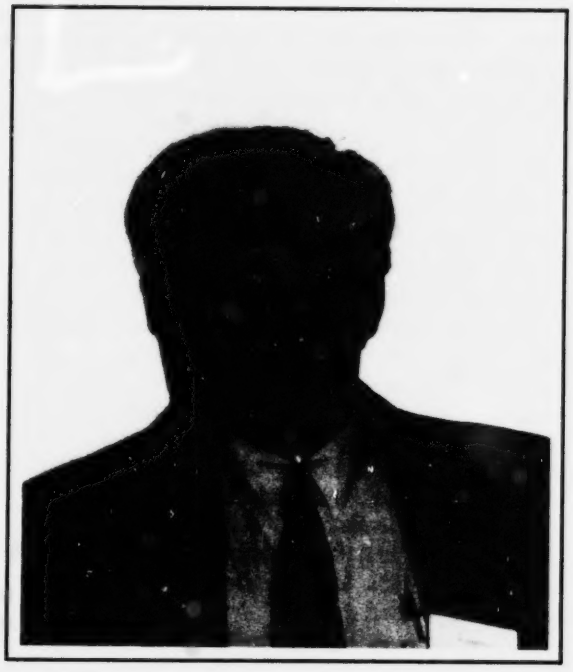
All research tells us that the effect of marbling on eating quality of beef is a myth. No one on taste panels could distinguish marbled meat. Also, consumers do not want to trim fat.

I don't think our grading system is at fault and want to make one point clear. The grading system we have is our industry's grading system. Producers designed the grading system using the government people as referres. Producers wanted strictly a specification classification system that had nothing to do with quality. They wanted a marketing tool for their fed beef. Trade, packers and everyone else insisted on bringing in grades and now we have a mixture that isn't working. They wouldn't let us get away from red, blue and brown stamps. They wanted age. We didn't want anything like that. We said let the market decide what quality was and it might change from day to day . Now the consumer thinks the best grade is an A, but what does that really mean?

Q. Where is branded beef being promoted and where do we stand in relation to that?

A. Most special attempts to merchandize brand name beef are aimed at the lean beef market, and are attempting to provide consistency.

GENETIC REQUIREMENTS FOR THE FEEDLOT MARKET



Allen R. Hingston, P. Ag.
Beef Program Manager
Saskatchewan Agriculture
Regina, Saskatchewan

The livestock industry in western Canada is the single largest customer of the grain, including wheat, oats and barley, that is grown in western Canada. The feedlot industry is part of that. The western Canadian livestock industry uses between 30 and 40% more grain than the next largest customer. The feedlot industry should never take a backseat when negotiating grain deals, it is too important.

In order to make your feedlot function, cattle entering the feedlot must meet certain requirements. Uniformity, predictability and performance are the major requirements. When you have a group of cattle coming into the feedlot, you want them to be the same and you want them to go out the same - that's uniformity. Predictability is perhaps even more important than actual performance if cattle are purchased. If you know ahead of time how cattle are going to perform you can price accordingly. If you know that my calves will only gain 1 pound per day you can still make a profit on them even if I have to pay you to take them out of my yard. The importance of predicting in advance what those cattle are going to do makes or breaks you because you can bid accordingly. Actual performance is important when you own the cattle in the feedlot. Under conditions of retained ownership you must concentrate on cattle that can grow, convert, yield and grade.

We unfortunately have a cow-calf industry that is under the impression that feedlots buy their calves. We also have some feedlot operators that think calves come out of the back of semi-trailer trucks. Even the retailer is not the final customer, the consumer is and the consumer is looking for uniformity. Comments regarding differences in quality are often heard. A can of beans is a can of beans is a can of beans. If you

buy Libby's beans you know exactly what they will taste like and what they will look like - that's uniformity. Uniformity in the beef business is size, weight, leaness, cutability and quality of eating. It can be argued as to whether the quality goes in after the hide comes off, but at any rate we're looking for uniformity.

The use of branded beef has been considered. When it comes to brands, uniformity is even more important. Certified Angus Beef was one of the first groups in the United States to start branding beef. HRI trade had successfully prevented any change in the US grading system because US grades were so wrapped up with consumer impressions of quality. The cattle industry is therefore making an end run around the grading system. The industry is coming up with its own standards, registering these standards and marketing them successfully. Certified Angus beef was the first. Several qualifications must be met before animals go into the feedlot. They have to be black, beef, and have no hump or ears. In other words there can be no evidence of Holstein or Brahma breeding. The carcasses must be in the top 2/3's of the USDA choice grade. They must be in the A maturity group and must be yield grade 3 or leaner. Carcasses must meet four other market specifications. Only one in four animals that passes the visual inspection will pass the carcass inspection. If the poultry producers had a failure rate like that in meeting their specifications, they would be out of business. But packers and retailers do a commendable job of marketing what cattlemen produce.

Uniformity is strived for but can never be attained, because cattle are biological animals. When a group of animals is measured for any trait, those measurements will fall into a normal distribution, under a bell-shaped curve (figure 1). In order to achieve uniformity in a biological population, the range of the distribution must be narrowed. To make improvements, the curve must be shifted to the right. The curve will not disappear. Regardless of culling procedures, some animals will index under a hundred or below average because they aren't all going to be the same.

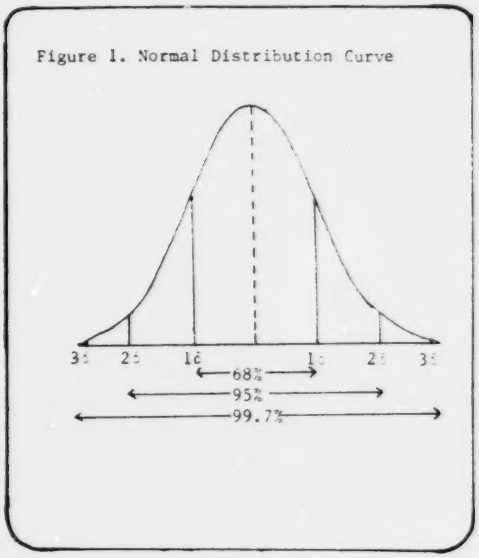


Figure 1. Normal Distribution Curve

Given that what the feedlot wants are things like gain, performance and feed efficiency and that these are measurable traits, one wonders why the cow-calf people haven't jumped on the band wagon to provide those things. The reason is that cow-calf and feedlot operators have different goals. The purpose of the feedlot is to market grain. Its goal is performance, gain, production or efficiency, whatever you want to call it. The purpose of the cow-calf operation is to market grass and in Saskatchewan, crop by-products. Its primary goal is reproduction. Dead calves have disappointing growth curves. The prime concern of the cow-calf operator is to get a live calf from that cow every year. When he loads the calf onto the semi-trailer truck and never gets any feedback,

there is really no incentive for him to do anything about the bottom end of that bell-shaped curve. The feedlot operator brings in whatever he can buy and sorts it down as best he can. His goal is something that can be measured every day in gain and feed efficiency. His objective is to make a profit.

A lack of communication between cow-calf and feedlot operators exists. Communication really starts when cow-calf operators feed their own cattle. I know a man who runs about 300 cows. Every year for as long as I can remember, he sold his calves in January, live, heifers and steers mixed, so many dollars apiece, take them all. That did not give him much incentive to worry about feedlot performance. As long as that cow had something with four feet, a tail and fur, he kept it. When he joined the beef stabilization program and got his first returns back, he went out and took another look at that cow herd. Suddenly not all his cows were good producers.

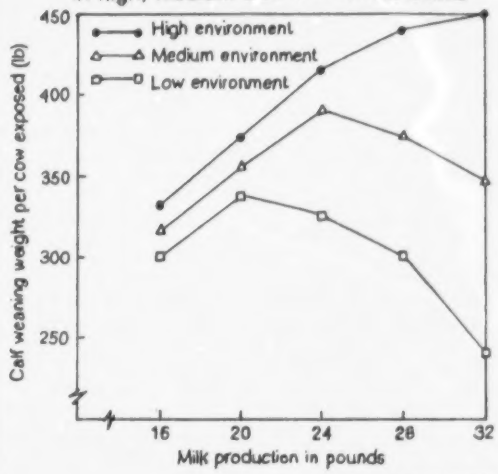
The communication between performance and reproduction is a necessity, but how do we marry the two? The situation is confounded even further when traits that are important to the cow-calf industry are considered. Fertility, calving ease, milking, hardiness, mothering and longevity have a heritability, as a combined unit, of somewhere between zero and 10%. In other words, they will be little, if at all improved by selection. To improve reproductive traits, crossbreeding must be used. The only brilliant thing that beef cattle geneticists have come up with in the last 30 years is crossbreeding. The feedlot, on the other hand, is interested in gain, feed efficiency, finish, carcass size and cutability. Those traits have a heritability of 50 to 60% and will improve if they are selected for.

The marriage between selection and crossbreeding took place a few years ago when exotic breeds were first imported. Prior to that, commercial cows were British crosses that all had Ayrshire in their backgrounds because everyone was milking cows at one time or another. As soon as cattlemen put their first Charolais bull on those cows, no one could believe the results. And they blamed it all on the Charolais bull. What they actually had was the perfect cross. They had a crossbred cow which they mated to a bull of a third breed, and they couldn't believe what had happened so they fell in love with the bull. They kept the heifers because they were the best looking heifers they'd ever seen. The end result was 3/4 cross cows and 7/8 cross cows and 15/16 cross cows. There are a number of commerical cattlemen that are purebred Charolais breeders but they don't even know it. That happened with every breed that was brought in. There are Simmental breeders in the industry that are in exactly the same position and they think they're commercial cattlemen.

These cattlemen started out with the greatest hybrid vigor they were ever going to see. In the push for performance they lost that hybrid vigor, but they do have some big cows. They forgot that the primary purpose of the cow herd was reproduction. That has probably been reinforced during the last few years with the dry spell that has resulted in more open cows and a longer, more dragged out calving period. Why? Because the main thing in the cow business is that the cow has to work where it is. It has to perform under the environment where it is kept. A study carried out in Montana compared cow productivity under three types of environment (figure 2).

Figure 2.

Cow productivity as a function of cow genetic potential for milk production in high, medium and low environments



Noder et al., 1979.

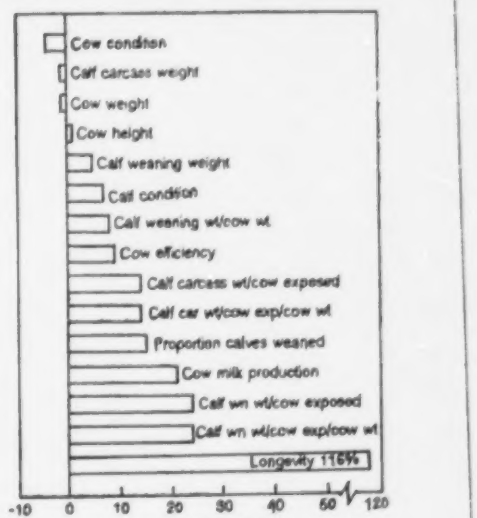
A high environment in Montana is probably irrigated pasture. A medium environment is one where it rains occasionally and a low environment is a basic short grass range. As milk production increases, the requirement of the cow increases as well. If that requirement is not met, cow productivity decreases. If the cow doesn't match the environment, then the environment must match the cow. If it doesn't, she will revert. Mother nature looks after her own.

Some acceptable goals in a cow-calf enterprise are a 95% conception rate in a 40 to 60 day breeding period and 95% calves weaned per cow wintered. Individual cow-calf operators must establish their own goals for 200 day weaning weight which will vary with management and environment. Two hundred day weaning weight will vary between 700 pounds where it rains once in a while and there's real grass and 375 pounds where the calving is late and pasture conditions are poor. In that environment, it is essential to have a cow that gets pregnant and not necessarily one that weans a 700 pound calf. The difference between those two groups is 1 1/2 pounds per day gain. The calf that weighed 700 pounds at weaning should be able to maintain a growth rate of 3 pounds per day and will be ready for market at 12 months of age. The calf that weighed 375 pounds at weaning, assuming that when it gets real feed it can go from 1 1/2 to 3 pounds/day gain which is highly unlikely, will at best weigh 900 pounds at one year of age. Only you can decide what the 200- and 365-day weight goals are going to be for your environment.

Every cow-calf environment is unique. Now it's different in the pig business. When you're inside one hog barn, you've been inside them all. Hog producers do not have to produce pigs that suit particular environments as do cattle breeders. A particular type of pig that performs well for one hog producer will likely do as well for another, because their environments are basically the same. Cattlemen are faced with a different situation. Cattle are produced in a variety of environments. Each producer has to decide which particular type of animal best suits his environment.

Crossbreeding and hybrid vigor have been mentioned and deserve an explanation. Crossbreeding results in hybrid vigor or heterosis. Heterosis is the amount by which the performance of crossbred progeny is better than the average performance of the parent breeds. Figure 3 shows how much maternal heterosis might be expected through crossbreeding. Cow condition and cow weight are slightly negative or poorer than the parental average, likely because crossbreds tend to be leaner. When reproduction enters the picture, in traits such as calf weight per cow exposed or cow milk production, heterosis in the range of 15 to 25% can be expected. Heterosis for longevity, which is a trait that generally combines all reproductive traits and refers to how long a cow will stay in the breeding herd after the first six years is 116%.

Figure 3.
Beef cow maternal heterosis for various traits of cows and calves, expressed as a percentage



The cow-calf man's goal is to get a live calf weaned every year. When he starts feeding those calves himself, he finds out there's more to life. But in the meantime, he follows a crossbreeding program religiously because he found it to be a good way to get pregnant cows to have live calves.

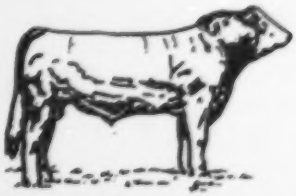
Crossbreeding is the way to improve reproductive traits. Is that compatible with the uniformity and predictability that feedlot operators want? Remember, there are 52 breeds of beef cattle available in Canada. If two- or three-breed crosses are run, there are 2500 different possible combinations of breeds to use. If four-way, backcross, recross, and crisscross methods are used, there are some 5000 different ways of combining breeds, which means there are ±7500 different variations that can be developed with those 52 breeds of cattle. And I know there are days when some of you go out and look at the pens of cattle you have and figure you have one of each combination. So how are we supposed to get uniformity and predictability out of this?

It can be argued that there are too many breeds of beef cattle. There are probably too many brands of toothpaste, breakfast cereal and automobiles, but people will buy them. It's called good marketing. One of the reasons everyone takes potshots at purebreeders is because they are successful marketers. They have a product that you can tell is different from other products, even if it's just a different color. I dream of someday waking up and finding every cow in the world one color. Then we can get on with the business of raising beef. But these purebreeders have successfully identified their product and are now into market segregation. They sell to someone for one reason and to someone else for another reason. It's just like Crest or McLeans toothpaste, or the gel toothpaste that all the teenage girls use because they want to have fresh breath. Someone did a good job of identifying a need and meeting it with a package. There are not too many breeds of beef cattle, because as long as someone can find some way of marketing them and making money, they will.

Not only do we have 52 breeds of beef cattle available and any number of ways of putting them together, but we all have our own idea as to what constitutes superior genetics. The photographs in figure 4 appeared in a paper two years ago. The dairy bull at the top of the advertisement was one of the most popular in North America. The formula below him will tell you within 50 cents what he's worth in your herd. The beef bull was grand champion at the 1983 Western National Stock Show, but no mention was made of his performance or breeding value.

Figure 4. Superior Genetics

8/83 PD +$293 +2289M-.02%+80F
PDT +1.93 TPI +740



Grand Champion
1983 Western National Stock Show

There are two kinds of beef cattle performance. Show ring performance is one kind and is fairly easy to judge. Animals are just lined up according to height and the ribbons are handed out. The American Journal of Animal Science contained an article that reported the heritability and repeatability of Hereford show ring placing and associated correlations . Researchers determined what influenced the show ring placings of 1500 Hereford bulls at the Denver Stock Show. The height of the animal had a 63% correlation to where that animal placed. Weight of the animal had a 43% correlation with place in the show ring. Genetically, the height of the dam of the animal had an 83% correlation to show ring placement. When something useful like maternal breeding value was considered, the correlation was 7%. The bottom line message was that maternal sires cannot be bought on the basis of show ring standards.

On the other hand, there are those of us that have gone around for years preaching that average daily gain was the end all and be all and a license to print money. So it is in the feedlot industry, and so it is in the cow-calf industry providing the cow-calf operator remembers that his cows must conceive and give birth to and wean live calves. Our ROP program has for years concentrated on single trait selection, for gain. Initially it was absolutely necessary. Some real strides were achieved in the beef industry. Our test stations, which some people have said are the show ring of the performance crowd, do exactly the same thing. They are single trait selection tools. All they do is basically measure how fast that animal gains from the day it enters the station until the day it leaves. What has happened is that maternal traits have been ignored. These methods of selection are trying to turn every breed into terminal cross sire breeds that will grow well in the feedlot but may not necessarily get pregnant out in the pasture where there isn't much grass and it doesn't rain.

Crossbreeding programs must be developed that keep maternal traits in the breeding herds, but still produce cattle that will gain adequately. Many crossbreeding schemes are available. I have a list here that I am embarrased to admit I used in a seminar a number of years ago. I hope nobody heard me. My list contained the following: 1) Static terminal sire system, 2) rotational terminal sire system, 3) specific three way cross incorporating two breed rotation as the maternal grand dam and 4) 2 and 3 breed rotational cross systems, using AI or multiple breeding pastures. I have a little note at the bottom that says none of the above work. The COBBETY system, or changing over bull battery every three years has been noted for its more practical approach. To stress the fact that you have to have plan if you are going to have a crossbreeding program, a COBBETY system using a three-breed rotational plan and with the following assumptions is presented in table 1:

Table 1. COBBETY crossbreeding system using three-breed rotation.

1. Breed 100 A cows to B bull.
2. Keep 30 AB heifers. Breed 100 A cows to B bull.
3. Keep 30 AB heifers. Breed 100 A cows to B bull; breed 30 AB heifers to H bull. Sell 30 A cows.
4. Keep 25 AB heifers. Breed 70 A and 30 AB cows to C bull; breed 30 AB heifers to H bull. Sell 30 A cows.
5. Keep 15 AC and 10 ABC heifers. Breed 40 A and 60 AB cows to C bull; breed 25 AB heifers to H bull. Sell 25 A cows.
6. Keep 5 AC and 20 ABC heifers. Breed 15 A and 85 AB cows to C bull; breed 15 AC and 10 ABC heifers to H bull. Sell 15 A and 10 AB cows.
7. Keep 25 ABC heifers. Breed 75 AB, 15 AC and 10 ABC cows to A bull; breed 5 AC and 20 ABC heifers to H bull. Sell 25 ABC cows.
8. Keep 18 ABA, 5 ACA and 2 ABCA heifers. Breed 50 AB, 20 AC and 30 ABC cows to A bull; breed 25 ABC heifers to H bull. Sell 25 AB cows.
9. Keep 8 ABA, 7 ACA and 10 ABCA heifers. Breed 25 AB, 20 AC and 55 ABC cows to A bull; breed 18 ABA, 5 ACA and 2 ABCA heifers to H bull. Sell 25 AB cows.
10. Keep 6 ACA and 19 ABCA heifers. Breed 20 AC, 55 ABC, 18 ABA, 5 ACA and 2 ABCA cows to B bull; breed 8 ABA, 7 ACA and 10 ABCA heifers to H bull. Sell 20 AC and 5 ABC cows.

1) all heifers are bred to a heifer bull and their calves are sold and

2) 30% annual replacement rate, with all replacements from within the herd.

Crossbreeding will work if your management is up to it. A straight-breeding program is much simpler to run but will not produce any heterosis. Assume you start with 100 cows of breed A and mate them to bulls of breed B in year one. In the second year those cows have AB calves, from which you save 30 AB heifers. The A cows are again bred to B bulls. In the third year, you still have 100 A cows which are bred a third time to B bulls . Thirty more AB heifers are kept for replacements. The previous 30 AB heifers are bred to a heifer bull. Thirty A cows are sold because we have 30 replacements ready to enter the herd. At the end of 4 years you have 70 A cows and 30 AB first-calf heifers which were bred to a C bull this time, and 30 AB heifers that were bred to the H bull. You only have 70 A cows so you can only keep 25 AB heifers. You sell all the ABH calves and another 30 A cows. At the end of the fifth year, the need for a plan becomes readily apparent. This crossbreeding scheme does not get easier. If you are a good manager and if you have a good plan and if you follow it, that's approximately what your herd will look like in 10 years. That is not a bad herd distribution.

Seventy five of your cows are sired by the C bull, you're breeding them to the B bull and they have A in their background. Your young cows are all sired by the A bull and will be mated to the B bull. You're getting as much heterosis or crossbreeding out of it as you can. What you're going to get from these cows here is basically a BC or a BA cross and they will group out fairly well. With this system, genetic progress is made and heterosis is maximized.

Problems begin if you deviate from the plan. With this system, you are keeping all your own replacement heifers. Let your imagination wander and suppose that you had no plan or decided you didn't want to sell some of the cows that your plan said you should sell because they were good cows- one of the advantages of crossbred cows is that they do last. I could almost guarantee that your herd would look like most of the cow herds we have in the industry today. Crossbreeding is effective only with a high level of management and with a plan.

The example of a COBBETY cross-breeding system was based on a 100-cow herd. A 1986 survey indicated that nearly 85% of the cow- calf operators in Saskatchewan have herds of less than 100 cows, 65% of which have less than 50 cows per herd. The reason I said none of my crossbreeding systems would work is because they don't work very well on small herds, which are a majority in Saskatchewan. With the small herd sizes we have in Saskatchewan, implementing these crossbreeding systems and putting the uniformity and predictability into the calves that the feedlot industry needs is a problem. Detailed and complex management would be required to successfully conduct crossbreeding schemes in these small herds. What is the solution?

I have some ideas and I'll throw them out for argument. In the pig business there are five breeds in use. Yorkshire, Landrace and Lacombe are used as maternal breeds and Duroc and Hampshire are used as terminal sires. I am not suggesting that we need to go back to 5 breeds, but in the pig business that's true, and under essentially one environment. In the pig business, producers buy their crossbred gilts from one person and their terminal boars from another person. They then concentrate on doing what they are in the business of doing, which is raising market hogs. It has been suggested that the breed makeup of replacement animals does not have to be known, as long as they perform. I would suggest that you don't even have to raise your own replacement heifers. Many producers are reluctant to purchase replacement heifers and feel the only way they know what they have is if they raise them themselves. We have to get beyond that. John Stewart-Smith said that 45% of the herd was needed to raise replacements and 55% for terminal cross market cattle. The way to make a crossbreeding system work is for a 45:55 split to be put into place, but not necessarily on the same farm.

There is an opportunity for people to raise crossbred heifers for those in the commercial business. The unfortunate thing is that people who are in the commercial business insist on paying commercial prices for such animals. Consequently people who are raising them aren't too fussy about doing it. In the hog business, suppliers will work on the specific breeding programs wanted by their commercial producers. The same could be done in the beef industry. As a commerical producer, decide on what breed of cows you want. Find somebody to raise the cattle for you . You would have uniformity in your herd because you would have, for example, Hereford-Angus cows which are bred to a Charolais bull, with all calves

marketed. Your supplier would have uniformity in his herd because he has Angus cows which he breeds to a Hereford bull. The purebreeder has a niche in this system because he could supply second string cows and heifers that don't quite meet his herd standards to the breeder supplying heifers to the commerical producer. Performance of these heifers could be guaranteed. Suppliers could breed them in the spring for 42 days, cull all open heifers, carry pregnant heifers through the first winter, calve them out and rebreed them prior to sale.

A purebreed crossbred heifer that's bred back would be available. It would be guaranteed fertile because it was bred twice in two 42 day breeding periods. Ease of calving would be evidenced by its calf at foot. This replacement female would be in your herd for 10 or 12 years. You'd never get rid of it, you'd get tired of looking at it.

This type of replacement heifer will not run cheap. This scheme may not be the answer, but it is a possibility. We have to get over the notion that the only way we can get heifers we can count on is to raise them ourselves. This scheme could meet the needs of all sectors of the beef industry. By allowing a specialized group to produce reproductively efficient breeding stock, the commericial cattleman could concentrate his management on getting desired uniformity and predictability into feeder cattle.

SOME ECONOMIC ASPECTS OF THE CANADIAN BEEF INDUSTRY

Dr. Andy Schmidtz
Van Fleet Chair
Department of Agricultural Economics
University of Saskatchewan
Saskatoon, Sask.

Some factors that will have a major impact on the future of the Canadian beef industry are what has been happening to the demand for red meat, policy uncertainties concerning the US 85 Farm Bill and counterveiling duty laws and the payment of the Crow. I want to discuss these issues and their relevance to the Canadian beef industry.

Demand For Red Meat

Stories have been circulating that consumers have stopped eating beef and are moving towards poultry and lean meats. People who have worked in this area in an attempt to quantify these results find that this has not been the case. The consumer attitude has never shifted against beef. Beef has just been too expensive relative to pork and poultry. In Canada the price of poultry seems much higher than that of beef and pork on a price relative basis, but that is not true in the US. Because of supply managed marketing boards in Canada, chickens and broilers are twice the price in Canada as in the United States. I would argue that in Canada there must be some health aspects to the demand for meat because poultry has increased in price relative to an increased market.

The United States recently announced a check-off system for cattle people that will bring in around 90 million dollars. No one knows what to do with the money although advertising firms think they will get part of it. Before cattle people put money into beef promotion, they should study the industry more and find out what will give the best return on their dollar. We completed a study for the California Egg Commission to determine whether it paid to advertise eggs. The egg industry was dying rapidly in the US because of the egg cholestrol scare. Per capita consumption of eggs in

California keeps dropping. Some of the results of our study were that the rate of return from advertising was zero to this point. Egg producers put in about 6 million dollars and got nothing back. That raised some serious questions about whether they could change their advertising promotion policy to accomplish anything. Now the Egg Commission has to decide whether to continue the check-off system for the next five years or terminate it.

The purpose of this whole story is does it pay to advertise beef? It is an interesting subject and one that requires a great deal of work. If beef is to be advertised, what will the returns be? What form should the advertising take? That raises the question of how to allocate money that may be available. When money is scarce, it should be allocated to the highest use. In my opinion, a top priority would be market promotion in both California and Japan.

Although California sells non-roll beef which is quite different from the graded cattle and carcasses marketed in both Canada and the United States, there is still a lot of potential in California. California has a population of almost 30 million people. As well, the Californian beef industry has diminished and their packing industry has gone to Iowa. California is a potentially good market that needs further development.

The second area that I would spend money on is the Japanese market. I find it incredible that Canada doesn't even have 1% of the Japanese market for beef. The Japanese market has grown considerably in the last 4 to 5 years. That market now has been taken up by the Americans, Argentinians and Australians. Yet Canada is supposed to be in the beef industry and has less than 1% of the Japanese market. The pork industry has done a miraculous job of marketing pork in Japan. Somehow that has never been done with beef. Japan is a big and growing market. Whoever is responsible in the beef industry for marketing has been doing a very poor job.

Canada went to leaner beef and Japan does not want lean beef. With a tight quota of beef going into Japan, you don't want to sell them low-grade or cheap beef, you want to sell them expensive beef. Similarly, we should be charging Japan $14 for wheat instead of $3. The Japanese will buy as much wheat at $14 as they will at $3 a bushel. The whole point of the Japanese market is that nothing has been done there in terms of export promotion and in terms of what could be done in the long run. If money is available to allocate to different areas, a good portion of it should go to these market development areas.

The US 85 Farm Bill

The second thing I want to discuss is this whole question of the US 85 Farm Bill and its implications for US and Canadian livestock. D. Gayle Johnson from the University of Chicago and I were on television about 6 months ago in the US debating the topic of the 85 Farm Bill and whether or not it will work. I still can't believe how politicians are that naive to think they can lower the loan rate and sell any more grain. If you understand anything about the grain business, price is pretty well irrelevant. So many countries are now agriculturally isolated from world markets that it doesn't matter what the price is on the international market. That's where I used the example of Japan. Japanese millers are paying $18-$20 per bushel for wheat now. If we move our price up $3 or $4 it isn't going to have any impact on them, except on the amount of revenue they will collect. Americans have now realized that by lowering the loan rate they couldn't sell any more wheat. In addition, when the US put in the Russian subsidy

the Russians bought no additional grain from them. There is hope that the American Farm Bill will change. That is where you cattle feeders have to be careful. There is a good chance that the 85 Farm Bill will move in a different direction after the November election. Stan Johnson of the Agriculture Department at Iowa State University has been in Washington arguing that Americans were wrong on the farm bill and should not have lowered the loan rate. So at least there are some people knocking on the doors in Washington. Ling is apparently supposed to announce a 10% acreage diversion program in addition to paying farmers to take land out of production. I think the US Farm Bill is going to change, and firmly believe that the future of Canadian agriculture depends on what the Americans are going to do.

The US Farm Bill cost Canada a minimum of one billion dollars. Estimates of up to 2 billion dollars are easily derived. Many people still don't understand where that number came from and what the 85 Farm Bill is all about. The 85 Farm Bill is simply this: As an example, producers are guaranteed $4.43 as the target price for wheat. If they belong to the program they get $4.43 per bushel of wheat. That's where Allan Blakeney got $6.00 Canadian wheat, by applying the exchange rate on what the American farmers were getting. The loan rate is a much lower price, being around $2.40 per bushel. It is essentially set at what price the commodity credit corporation needs to store it. The loan rate sets the floor on incoming grain prices. The 85 Farm Bill cost Canada over a billion dollars because the Americans lowered the loan rate by $1.00. When their loan rate went down $1.00, Canadian wheat went down $1.00 because the Canadian Wheat Board, in order to make sales, likely had to undercut the loan rate by about 10 cents. The wheat movement in Saskatchewan next year will likely be pretty good. I suspect prices may well float under the loan rate although feed wheat prices have recently been increasing. My whole point is that Canadian farmers are in trouble at the moment, from the wheat producers' standpoint, simply because of US farm policy. I would never seriously negotiate free trade with the Americans unless the 85 Farm Bill was discussed at the same time. The cost of the 85 Farm Bill is much greater than what the gains of freer trade with the Americans would be. Certainly the beef people have the most at stake in terms of freer trade. But even those gains are nothing like the cost of the 85 Farm Bill. Free trade talks must emphasize the 85 Farm Bill because that is where Canadians have to come to grips in terms of long run solutions to their problems.

My friends in the United States have been telling me about supply responses given the low feed grain prices. Corn is now available for under $1.00 a bushel in Iowa. They have another program of buying grain certificates through which I think they can buy corn for less than $1.00 if they buy these grain certificates and trade them back in for corn. The question is what is going to happen to supply response because of higher grain prices. No one knows. Similarly, no one understood this spring when wheat was the lowest price in history why Canada had a record wheat acreage. If wheat stays this low next spring I'd wager a bet that wheat agreage will be even higher than it was this year. That has problems for economists because when we teach economics, we usually argue that when the price goes up quantity goes up, and when the price comes down quantity comes down. Now we have ourselves in a different situation. The interesting question is will these people expand production. Stan Johnson from Iowa argues that in the hog industry there will be a rapid increase in the supply of hogs because of the low grain prices there at the moment. I don't agree with him, but he knows that area

very well. In beef there is less optimism in terms of supply response because cattlemen will be very reluctant to increase cow numbers. The number of cattle on feed and the poundage of beef may increase, but there will not be a rapid increase in cow-calf numbers.

Policy Uncertainties

A friend of mine at Berkely wrote a paper on producer management under policy uncertainty. His arguement was that the future of agriculture depends much more on policy than it does on anything else. Farmers face one big obstacle at the moment and that is to figure out what politicians are going to do. Major items that currently fit the category of policy uncertainty are the following:

1) The US farm bill. No one knows which direction it will take.

2) Canadian border disputes and counterveiling duties.

3) Payment of the Crow. Either the producer or the railroad will be paid or Crow bonds will be issued.

4) Uncertainty in the international trade grains due to the US Farm Bill.

5) Debate on tripartite.

6) Debate over venture capital corporations.

7) The notion of policy impacts and what is going to happen to Alberta cattle feeding vs. Saskatchewan cattle feeding. Will Alberta feed more cattle in the future than Saskatchewan? Does Alberta have a comparative advantage over Sask.?

8) The interface of the beef industry with the grain sector, which is still antagonistic at times in the long run.

9) Price-fixing policies in the US. There was a large lawsuit in the US about meat prices. It was lodged against Iowa Beef by cow-calf and feedlot people in terms of what happened to the buying and selling of cattle. The case was also against the retail chains. It was settled out of court for a small settlement. The US law now reads that producers cannot sue retailers because producers don't sell meat to retailers. They sell to packers and packers sell to retailers. That was what they called the famous Illinois Brick Ruling that now prevents cattlemen from taking any action in price-fixing cases against anyone but packers. It will be interesting to see what happens in the long run in terms of this whole price fixing argument.

I would like to see someone document why the packing industry in the US changed the way it did. At one time, Armour and Swift were the two largest packers in the United States. They are now totally insignificant. It has been interesting how one firm called Iowa Beef essentially took over the beef market. Their takeover was partly due to the notion of boxed beef. In California there are no longer any butchers. Stores order boxed beef directly from Iowa Beef. It is interesting how, with over 200 million people in one country, a packing industry became so concentrated that one firm essentially took over butchering.

When I first came to the University of Saskatchewan I got myself into hot water with the beef industry when I jokingly said, "You know, Kenny Montford could feed all the cattle in Saskatchewan in one feedlot". The size of his feedlot is 250,000 head. My point was that if you are going to feed cattle, you have to do it right. You can't make do with pails and chop like we did as kids. Feeding cattle is now big business.

A business approach has to be taken to feeding cattle or it will never work. The other option is do nothing with all the cattle in your province. There are tremendous economies of scale in cattle feeding. In that connection, we don't even know yet what makes those large feedlots tick in the US. Most of those cattle operators feed their own cattle. We have never documented feeders like Kenny Montford, in terms of who owns the cattle, what the tax implications are and what kinds of corporations exist. We make statements but no one can prove or disprove them. One proposal I would put forward to this industry is that we should throw in a little money and have someone go down and try to document cattle feeding across the border.

Future of the Beef Industry

I want to conclude with some comments about the future of the beef industry. I am hopeful that on the demand side we have reached a turning point in the demand for red meat. I think we will give poultry a good run for their money if we do it right. At the present time in the US, and it's true now in Canada, the medical association is starting to place a lot of weight on beef, arguing that beef is good for you. The whole cholestrol issue is starting to die out. That will have a tremendous impact on the demand for red meat. It is my opinion that American cattlemen are going to start squealing on the poultrymen in terms of fat content in the final product and the use of antibiotics in production. The beef industry has never squealed on the poultry industry but I think it will.

I was also fascinated to learn of a single poultry operation in Maryland that feeds enough chickens to supply the whole east coast area. Apparently this was accomplished with vertical integration right from the chickens all the way up to the final stages. His advertising campaigns have really paid off. Our beef industry is quite a bit behind in terms of how to market our commodity. We have become efficient at feeding cattle, but have neglected the marketing aspect.

On the policy side, I believe the Crow will go in favour of cattlemen. What Canada will do with the Americans on the counterveiling duty law will be interesting. I would suggest that Canadian cattlemen spend money now to do some lobbying in Washington. That's where the notion of rent-seeking is. That's why for a long time American cattlemen were wrong. They believed in the free market but no one else did. Everyone else was collecting all their economic rents and the cattlemen found out that they were broke. They have now changed their whole attitude and strategy on getting money from Washington.

Canadians should argue the 85 Farm Bill with free trade and stop the Americans on their counterveiling duty law. If it cannot be stopped, Canadian cattlemen are in for tough times. If the US shuts the borders at will, where will Canadian beef go? On the margin Canada does not have a Japanese market, although with some promotion it could. Canada has to sell to the American market and the counterveiling duty laws will be the stumbling block. The unfortunate thing is that the Americans are so far not going to negotiate counterveiling duty laws with free trade and have no intention at the moment of withdrawing their counterveiling duty action legislation.

Under the counterveiling duty action legislation, all the Americans have to do is get a complaint from a producer group. The American Treasury or Commerce Department comes to Canada and investigates what the levels of subsidies are in that sector. They then go to the International Trade Commission which determines whether there has been damage done to the industry. The International Trade

Commission is an American court that plays by American rules. They don't care about their own subsidies on products, they just care about Canadian subsidies.

I don't think we Canadians did a great job in terms of doing our homework during the hog investigation. The ruling was damage in the hog case and the US put a duty on live hogs and hog products coming in from Canada. A subsidy by definition has to be known before the fact not after the fact. Consider, for example, the Western Grain Stabilization Program. If we knew every farmer was going to get a subsidy through WGS, every farmer would have been in it. Farmers did not enter the hog programs knowing they were going to receive subsidies. Yet the International Trade Commission ruled that those programs were subsidies.

In drawing a parallel with beef, I hope that this group is going to spend some money and go down to Washington with their guns. High-powered people deal in Washington. If you enter that league, you have to hire the talent that can deal in it. If you think you can get someone to go down and defend the beef industry for $5,000 or $10,000 you might as well not phone anyone because good people don't work for that. The counterveiling duties act will become a serious issue. I would suggest that through whatever contacts you have with the Canadian Cattlemens Association you find out who they are going to send to Washington and what their proposals will be. They must appear in the US court, the International Trade Commission. The impression I got at a recent livestock convention in South Carolina was that at least those groups were not that interested in pursuing a counterveiling duty on beef. They think that Canada is dealing square with them and that any subsidies Canada has would be difficult to prove. But other groups will push them. At that time it will be up to Canada to first of all define which programs are subsidies and which are not and then to argue the case in Washington. If the counterveiling duty law is not changed the situation could jeopardize the Canadian beef industry.

Canada now has no constraints on beef for the US market. Quotas are not binding. The reason Canada doesn't ship more beef across the border is partly due to the profitability of the industry. It is not due to any barriers on trade.

If we can take care of the problem of counterveiling duty laws, and learn how to wisely manage risk in terms of grain prices, knowing that grain prices could double and that they will, then Canada will have a good beef industry.

If we don't play this feed grain game right, if we don't look down the road at what will happen to the US Farm Bill and strengthening grain prices and if we don't deal with some of the trade issues, then I would predict that the Canadian beef industry could die a slow death like it did in the early 70's.

Discussion

Q. What do you think personally about free trade?

A. When I teach international trade, I argue that without trade, nations would be lost. Saskatchewan would not exist without international trade and I guess all of Canada would not exist. We depend heavily on trade. My point is that the term free trade is wrong because it is really not free in the sense that commodities cost money and that we have many barriers on both sides of the border. In principle I support liberalized trade in the world. Unfortunately I believe that the US is becoming more and more protectionist. The problem with free trade is that as Canadians we are not

going to give up much and neither are the Americans. There is no way that the Canadian Wheat Board or supply managed marketing boards in Canada will be given up. Because US agriculture is as assorted as that in Canada it becomes difficult on a commodity for commodity basis to determine where commodities will come from. I strongly favour having the counterveiling duty law dismantled. I think for Canadians it has to be dismantled. Freer trade is very important for the beef industry. But it does not mean that we will give up our rights. The Americans have to trade with us given the way other nations are starting to close their borders. We have no future without the US, both in terms of trade and what they will do in the market.

Q. What would free trade do to our production?

A. I'll use the price of turkeys as an example. Before we left the US, we bought turkeys for 69 cents per pound, which is almost half the price of turkey in Canada. In these commodities there is a tremendous difference in prices. If the border opened, no more commodities would be imported but the total rationalization of the industry would change. Maybe Sask wouldn't produce any more chickens or eggs. All they would likely do is produce in different areas. Economies of scale would be implemented. Canadian producers could compete with the Americans if we changed the structure of our organizations. It does not imply that with freer trade we would not produce any more chickens or eggs.

Q. How can we have free trade when we have such different wage rates?

A. The reason Armour and Swift went broke was not just because of the boxed beef concept, it was because of the wage rates. Unions essentailly killed Armour and Swift. People in the packing business know that a big problem when it comes to freer trade is that labor rates are totally different in the two countries.

Q. We hear that with free trade the hog industry is in jeopardy and we are uncertain about the future of our beef industry. Where do you think the beef industry stands in a free trade market and how will the Americans look at our stabilization program?

A. In terms of our Canadian pork people, I give them credit. Whatever they're doing, they're doing it right. They have captured a tremendous market in the US and Japan that I think will be there for quite a while. In terms of beef, I would argue that Canada can compete with the US and I would argue for free trade in red meat and beef. I think the flow of cattle will go in that direction. If it doesn't, cattle will always come in through Eastern Canada and go back out through the Western USA. I think we have an advantage in beef. I hear a lot of people in the California market that think we can easily compete with California, which is surprising given their climate. But they have such high opportunity costs for their money that if the profit and the wages aren't up there, they won't get into the business. They have a lot more opportunites than we have here. They are looking down the road and are reluctant to get into beef or start expanding.

With regard to the stabilization program, we have to get our homework done and be ready and able to document this program when the Americans try to investigate our beef industry. We should also be careful about what kind of information we give them. I would not give them any information until they asked for it and then I would be extremely selective through the use of attorneys about what information they would get. The Red Meat Stabilization Program is what the US could get the Canadian beef industry on.

The Americans have more subsidies than Canada has, but in court that doesn't count. The key is to be prepared for an investigation with documentation and counterarguments.

Q. It seems to me that as beef producers we keep worrying about the pork and poultry industries when we should be fighting for beef.

A. As a strategy you may, at times, have to take a shot at the poultry industry because they are always coming out as "the clean people" that produce the product that beef people cannot. At the very least more has to be done in terms of advertising nutriton and saying beef is as good for you as poultry. Perhaps we should emphasize that although some people do eat too much beef there is a whole segment of the population that is not eating enough beef. That is where the medical association is on our side at the moment. We need to get the nutrition message across. I do not know which organization or group in the beef industry is in charge of promotion but promotion is what Canada has been bad at for years. We have spent money on becoming efficient in production but we have not paralleled that with marketing our product and penetrating the demand side of the industry.

Q. You have talked about the industry but haven't speculated on the way beef will be eaten in the future. I saw some statistics that show we have moved in thirty years from 30% eaten ground to over 50% eaten ground, which seems to be at odds with cattle feeding. What will this mean in the future?

A. I'll relate some US developments in this area. Kenny Montford is in the businees of establishing his own packing plant to cater to the fast food market by packaging steaks in a manner that people can actually cook them faster. Fast food franchises are growing at an unbelievable rate. Fewer people are eating at home. That has strong implications for the demand and type of beef. Certainly the hamburger and the demand for lean beef has to increase relative to fat beef. In that regard, I think most steak restaurants do a dismal job of providing steak. When we were at the livestock convention in South Carolina chicken was served. When we went out at night to dine beef people were all eating fish. So I asked them why. They said that if they had a chance they would order fish because most steak restaurants do a terrible job of preparing steak. I would start raising static with restaurant owners.

On the margin, things make a difference. This is not an average concept. It is on the margin where a 1% or 5% increase can make a difference. It doesn't take that much growth for one percentage to have a significant impact. If we could get even 10% of the Japanese market, which I think is reasonable, it would really help. So write to the Prime Minister and say Schmidtz spoke and said we don't even have 1% of the market and we're going to get 10% of the Japanese market. Or else say sorry Japan, we aren't interested in buying any automobiles at the moment. Let's do some barter trade. If you are going to continue bringing in automobiles, why not take back some of our beef? Japan has relaxed their trade quotas but we have done nothing.

We conducted a study to determine why Australia and Argentina seem to have a comparative advantage. Time on grass is always pointed out, but that applies only to grass-fed beef. I don't understand how they can compete for Colby beef or really fat beef in Japan. They do not grain feed beef in Australia. Why does Australia beat the pants off Canada in the California beef market? One problem is that many of the California buyers never even think of Canada as a beef supplier. Our main problem is that whoever is supposed to be marketing our beef is

not doing their job. California has a population of 30 million people and is close by. Twelve to 1600 miles is a short distance, but we aren't developing that potential market.

Q. Why is there no market in Japan for Colby beef from Western Canada?

A. That is the issue. Apparently Agriculture Canada says they tried at times to ship Colby beef into Japan. But livestock market specialists from Japan say Canada has never made the effort to ship fat beef, the type they want, to Japan. There is a demand for Colby beef in Japan. That niche has to be filled by either the packers or some of you producers with a specialized type of product.

The other way the industry is going is to contracting feedlots. I hear rumors that Safeway on the west coast is going to start contracting all their beef directly from feedlots, which will eliminate the market concept of buying and selling. I think this will happen in many areas, particularly for specialized products. With our grading system we emphasized lean beef and with that beef we'll never get into Japan. It will require specialized feeding and some promotion efforts. That is where the hog industry has paid off.

Q. I've personally felt that the price of grain will not turn around until about the time of the second coming unless the US decides to dismantle their farm bill. Cow people could now sell their cows for $1200 and because of the effects of the US Farm Bill buy them back for half the price.

A. Yes, grain is the issue in the feeder businees. That is why it is important to understand and follow the US Farm Bill. My gut feeling is that there are going to be changes made to the 85 farm bill because even though consumers say they pay farmers a lot of money, politicians are starting to look silly with their notion of trying to give more money to the Russians and give some of these rich countries grain for nothing. It is starting to backfire and they can't go on forever giving the Russians wheat for $2.00. I also think we have been underplaying the grain market too long. The grain farmers are much too pessimistic, as they were in 1971. There is something going on right now in the wheat futures that will be interesting.

Q. Anyone can see that the European common market is going to fall, when farmers are being paid $6.00 for wheat that is being sold for $2.00.

A. The American Farm Bill was directed against Europe. Americans thought that by lowering the loan rate the European common market would lower their subsidies. But Europe told the Americans that they could drop their wheat price to zero and it would not affect European policies. So the farm bill has backfired there too. Regan didn't put in the farm bill to hurt the Canadians or Australians.

Q. How long can the European market keep up with their current subsidy program?

A. European farmers, who happen to be tremendous lobbyists, say that their current pricing policies will exist as long as there is farming in Europe. They say politically that their farm size and the whole social structure depends on it and no politicians will fight it. As an aside, the European Common Market has a tremendous stock pile of beef.

Q. You've talked about lobbying and economic rent-seeking, could you expand on how it relates to our beef industry?

A. A student at Berkely looked into this topic in different agricultural industries in North America in terms of what kind of government involvement they aim for and how much rent-seeking they do through lobbying activities.

He found that the beef industry was at the bottom of the pole. This is where our dilemna is about free market economics. When Milton Freedman talks free market economics, he's talking about all markets free with no labor unions and no trade barriers. But they are so far away from the free market at the moment. So you have to run an industry given all these other barriers that exist.

We are now starting to learn how to run the beef industry as an industry like others that get their fair share. You can't have an industry thrive if it is not thriving because of free market processing. You can't have Canada going down to tubes, or Saskatchewan, and say it was because of climate. If other industries do not want to remove their distortions, you have to increase your distortions to make them comparable. That was my point about rent-seeking. I think the cattle people finally realize that now. It isn't because you cattle people don't want free markets. It is just that no one else is playing the same game in town.

ANIMAL HEALTH UPDATE AND PRECONDITIONING

Dr. Terry Church, D.V.M.
Head, Preventative Medicine Branch
Animal Health Division
Alberta Agriculture
Edmonton, Alberta

This presentation will review feedlot health management practices, including the new concepts and ideas that have been developed. Results obtained with preconditioning and the use of some of the new drugs available on the market will be discussed.

Minimizing Feedlot Disease

The theme of this presentation is minimizing feedlot diseases. A review of the basic concepts of feedlot diseases is in order. Most important feedlot diseases occur within the first six weeks after arrival in the feedlot. The first 1 to 3 weeks are critical.

Feedlot diseases are complex. They are not a simple kind of disease like blackleg. Blackleg is caused by a single infectious agent that is easily identifiable and can be effectively controlled with a single vaccine if properly administered.

Feedlot diseases are not that simple. They are a complex of infectious agents and management. Most are stress-related, stress being all the things we do to cattle when we move them from their home ranches into the feedlots, when the calves are weaned and when feed and weather change. Stress interplays with the development of the disease. There is no simple prevention for most feedlot diseases.

With the complexity of feedlot diseases it is helpful to know what disease levels could be expected. Feedlots in Alberta recorded an average death loss of 1 to 2% for yearlings and 1.5 to 3% for calves last year. These levels may be high for yearlings under good management, but last fall a 3% death loss for calves was a very conservative estimate. Many feedlots had death losses running up to 5% and a high number of health wrecks. Two of the

dominant factors involved were 1) the weather as it affected marketing patterns and 2) the withdrawal of chloramphenicol from the market. As well, some operators shifted from feeding yearlings to feeding calves and learned that disease management of yearling feeders can be quite simple compared to that of calves.

Disease levels can be measured by culling rate and sickness rate. Culling rate refers to the number of animals that do not respond, have a poor rate of gain, and have to be culled for whatever reason. Sickness rate is highly variable, especially in younger animals. It can be predicted fairly accurately in yearlings and usually reaches levels of 10, 15 and 20%. With calves, a 10 to 50% sickness rate is conservative. Some feedlots reported morbidity or sickness rates of over 100%, which means they treated all the animals in the pen at least once and then started over again.

In practical terms of handling feedlot diseases there are 3 major areas of concern: 1) pen checking, 2) treatment and 3) mass medication. The important principles of pen checking are to identify sick animals and to promptly remove them to the hospital area. Promptness is important. There is only a short time in which to successfully treat sickness, particularly since the removal of chloramphenicol from the market. New cattle must be checked twice a day.

Trained animal health technicians are often employed in the hospital areas of Alberta feedlots. Their competency has resulted in a major improvement in the feedlots. Immediate isolation and treatment is important. Isolation means removing sick animals from the feeding pens to reduce disease spread. Thermometers are required to determine the degree of sickness and response to treatment. Electronic thermometers are a very worthwhile investment.

Drug failure is often regarded as the cause of treatment failure. The simple reason why most drugs fail is that the animal was a late pull to start with; an animal that already had very advanced stages of disease which were difficult to reverse.

Another mistake cattle people often make is that they do not treat long enough. Treatment for a minimum of 4 days and probably 5 or more days is needed. Treatment for only 1 or 2 days is cheaper and labour saving but unrealistic. A high number of relapses often indicates that the treatment interval has not been long enough to get the infection under control. It does not necessarily mean the drug was not working. When relapses occur, it may be worth while to call a veterinarian.

Table 1. Reasons for treatment failure

1. Wrong diagnosis
2. Disease too advanced prior to treatment
3. Inadequate dosages of antibiotics or not treating long enough
4. Wrong treatment
5. Level of antibiotic resistance

Of the various reasons for treatment failure (table 1), level of antibiotic resistance is the least important. The reasons for treatment failure can only be determined at post-mortem. Post-mortem examinations are a worthwhile effort. They can determine reasons for treatment failure and integrate that information back into the operation.

Prevention of diseases must start with management. The toughest job in the world is to sell management changes instead of vaccines. Farmers consider their time to be their most precious commodity. Many management

changes that are recommended require more time and some self-criticism, both of which are hard to accept. But disease prevention is in how animals are managed. Vaccines and animal health products should be added only on top of good management for disease prevention to be effective.

Disease prevention in the feedlot is influenced by 6 concepts involving the nature of the buying decision. Time of purchase is important as it relates to the age of the calves. Calves bought in February are a much different commodity health-wise than they were in October. Unfortunately the most convenient time to wean, based on our cultural and farming practices, is in the fall when calves are 6-7 months of age. This age corresponds to the time in life when the natural defences and immunity of the calves are at their lowest. Calves are less susceptible before and after 6 months of age, but our marketing system has evolved whereby most calves are weaned and sold at the time when they are most susceptible.

Sex influences disease prevention. Obviously steers don't get the same diseases as heifers and don't get pregant.

Another component of buying is health status. Health status is not only affected by the animal's age, but also by the kind of calf purchased, ranging from calves that are preconditioned and have the highest health status, to those that come direct from the farm or ranch and bypass the auction market, to the biggest range which includes calves sold by farmers through the auction system, to the dealer calves or stale calves that have been in the system a week or 10 days and typically have the lowest health status on the market.

Another concept of the buying process is the mixing factor, which is largely unrecognized. The amount of mixing primarily depends on the purchase group size. Due to our marketing system and specifications usually placed on orders , on average only 3 to 5 animals are purchased from the same farm or origin. Therefore a tremendous amount of mixing occurs. Mixing allows disease organisms to spread. That's why calves that come from the ranch directly into the feedlot have a much better health status than calves purchased through auction markets. They are not mixed. If they are treated as a separate group, health status can be improved. Calves of different health status should not be mixed. A common problem is the producer who retains ownership of a small number of calves. He weans them and typicaly one week to 10 days later purchases another 50 head, brings them home, mixes them with his own calves, and provokes an outbreak of respiratory disease. That situation was created by mixing. Those two groups of calves should have been kept separate for 6 to 8 weeks.

Another reason for health problems is the fall weather and marketing system. It is tragic that we are so locked into the system of selling calves in the later part of October and early November. Cow-calf people think that's when the buyers are there. Buyers purchase at that time because that's when the calves are on the market. We should break out of that tradition. Calves going on feed in September or December are much healthier than those going on feed in October. Whenever winter arrives quickly, it seems predictable that ITEME will break out 7 to 10 days later. Weather changeability provokes a higher level of diseases, especially pneumonia and coccidiosis, than that which occurs in an area with more stable weather.

Transportation is not too critical for Western Canadian feeders where distances are relativley short but becomes more critical for Ontario producers who feed calves that have been transported for days. In any case, conditions of transportation should not be ignored. If my calves were loaded into a semi-trailer bed knee-deep in manure, I would soon find a new trucker.

Feedlot design can affect health. The most important item is pen size which affects the mix. The larger the pen, the more mixing required to fill the pen. A large pen size not only increases mixing and opportunity for disease spread, but prolongs the mixing effect because the pen is open longer. Optimal size is 150 yearlings or 200 calves in terms of both handling and filling. It may not be optimal for management and efficiency of feed delivery, but it is optimal healthwise. The worst pen sizes are those holding 400 and 500 head. Health problems can be incredible, especially if these are starting pens. Proper drainage, shelter and bedding are all common sense factors that influence health.

The feeding regime used can also influence disease prevention. An outbreak of shipping fever can be aggravated if calves are grain overloaded at a time when shipping fever could be expected to occur. Grain overload can only be recongized through post mortem examination.

The simple fact of the way calves are put on feed can markedly influence their health status. It used to be fashionable to talk of getting cattle onto full feed within 7 days. In retrospect, the amount of bloat and scouring that was present indicates that an incredible amount of grain overload occurred. The only reason it was not severe is because most cattle fed then were yearlings. Had they been calves, death losses would have been immense. The most important factor with calves is to get them to eat. It is less important what they eat as long as they eat. Calves should have immediate access to palatable, good quality grass hay for two days (include receiving day as one day). A starter ration could contain about 1 part grain to 2 parts roughage. Care should be taken with ration changes, not only changing the roughage to concentrate ratio, but also changing from dry to silage type roughages. Waterers should be located on the fenceline for calves. That is where they walk around looking for a way out. It may take 5 to 6 days for them to find a waterer in middle of the pen. The single most important reason why feed consumption drops is because the waterer quits. If cattle aren't drinking they will not eat.

Disease prevention should begin when cattle are being processed. It cannot be over-emphasized that disease prevention starts with good management, and not with expensive vaccines. The major causes of feedlot wrecks are summarized in table 2 and point out the areas of management that are often involved.

Table 2. Causes of feedlot wrecks

1. Source and origin of cattle
2. Poor vaccination programs
3. Intermittent feeding errors
4. Overcrowding starting pens
5. Inadequate pen checking
6. Overcrowded hospital area
7. Poor health monitoring:
   - no records
   - no thermometer
   - no post mortems
8. Incorrect treatments
9. Too rapid expansion
10. Too many incoming cattle
11. Poor communications

The most important aspect of processing is to evaluate the new arrivals. Preventative programs must be tailored to individual operations. Incoming cattle should be visually examined. One of biggest problems is that most cattle come into feedlots at night. Visual examinations only reveal so much. One of the emerging concepts of helping to ease the problem of sickness in the feedlots is taking the temperatures of all new arrivals in the feedlots. It is a considerable extra input in the processing scheme even with an electronic thermometer. But it pays off if good records are kept. Some of the feedlots who take temperatures on a regular basis have found that over half the calves that died last year were calves that were sick within 4 or 5 days of arrival. That means they were coming in sick. 'Temping' calves on arrival is one of the most useful ways of evaluating health status and detecting problems early. Individual animals can then be treated or if 10 to 15% of the group have elevated temperatures, the entire group can be mass medicated. Buyers should be pressed to return bad cattle.

Mass medications can be an effective way of stopping an outbreak. Timing of mass medication is the critical factor. Mass medicating calves immediately after buying or weaning them is of no value. Diseases cannot be extinguished by treating prior to the outbreak. Cattle must be treated at the beginning of the outbreak, which can be determined effectively by taking temperatures. Mass medication is often too late because symptoms were not recognized soon enough.

Research on the effect of mass medication is scarce. One useful study was conducted in New Mexico. Results were reported in the Journal of Animal Science (table 3). Granted New Mexico is a long way from Saskatchewan and the results may not be applicable to western Canada, but the treatments applied are well worth looking at. Calves were long-hauled, highly stressed and got sick within 5 to 7 days of arrival. They received no treatment (control), were mass medicated for either 4 or 7 days, or treated with Aureo S700 at 4 times the recommended level for 2 to 3 weeks. In the group receiving no treatment (control), the sickness rate was 60 to 70% and the death loss was 0 to 12%. Medicating for the first 4 days of arrival (small farm syndrome) achieved no health improvement likely because treatment was too early. Mass medicating for 7 days dramatically improved health status of the calves. Sickness rate was reduced and no death losses occurred. This illustrated the value of medicating at the right time. Feeding Aureo S700, which was widely promoted for stress prevention, at four times the recommended level for 2 to 3 weeks was of no benefit in controlling respiratotry diseases.

Table 3. Results of four trials on mass medication in New Mexico

Treatment	Morbidity	Mortality
Control	52-68%	0-12%
4 day Med.	28-59%	1.5-8.3%
7 day Med.	6-14%	0%
Aureo S700	69.5%	1.2%

Of the mass medications available for the treatment of shipping fever, long acting tetracycline by injection is more convenient to administer than is adding sulfa to the drinking water. Diseases like ITEM and footrot usually respond to tetracycline type drugs added to the feed.

Preconditioning

A survey of the results of preconditioning was conducted in Alberta based on eartagging calves. The program required that calves be owned for a minimum of 45 days to prevent buying and reselling, calves be a minimum of 4 months of age at vaccination for IBR, PI3 and clostridial diseases and that calves must have been weaned for a minimum of 45 days. Calves sold must be accompanied by certificates to ensure that they are preconditioned. Eartags are required to make these calves visible. Certificates signed by both veterinarian and producer give the calves credability. One of the biggest problems with preconditioning is that the word is very badly abused. The selling system virtually calls every calf preconditioned in reference to anything from a shot of blackleg vaccine or long acting penicillin to a calf that has been weaned for 10 days. A healthy scepticism for preconditioning is required. Only those calves known to have had the required treatments should be accepted as preconditioned.

The main issue for the cattle feeder is the price differential. The five-year average in Alberta was a $4.80 premium per cwt for steers and $4.09 per cwt for heifers. Last year preconditioned calves brought $5.90 per cwt premium over regular calves. Prices of heifers are often more variable than steers, reflecting whether people are buying heifers as replacments or as feeders.

The cow-calf producer is in a position to benefit significantly from preconditioning. Net return can be increased by marketing a heavier calf and by getting a higher price. They want to judge preconditioning against the premium. Preconditioning will not work if the producers are interested in only the premium price. The extra weight put the calves is where they can gain considerably, especially in the present market when a pound of gain costs $.50 and returns $1.05. Preconditioning is difficult to sell because it means more labour input that can be required at a time of competitive labor during harvesting. It is also difficult to get cow-calf people to recognize that these calves are heavier. Unless calves are weighed, most producers cannot perceive that their calves are 40 or 60 pounds heavier than last year's crop. These are the main difficulties of the program.

Preconditioning does provide alternatives. It gives greater market flexibility. Once calves are weaned they can be held until a more desirable market is available.

Preconditioning provides better utilization of fall pastures. Weaning calves makes a tremendous difference to the cows. Studies indicated that when calves were left on the cows, on average short grass pastures in Alberta, cows lost one pound per day. If calves were weaned, those cows gained a pound a day. Cow condition is important and if fall pastures are limiting, then preconditioning can help out in that respect.

Preconditioning is also an important program for marketing. It improves producers' marketing prospects because they have to get into a planned marketing program. In Alberta, areas south of Calgary generally have good markets with reasonable numbers and predetermined times of selling. Two-thirds of the province's calves are produced in central Alberta in operations secondary to grain production. In those cases, calves are weaned when it is convenient to do so. In preconditioning, producers must plan when they will wean and sell. This strengthens their sales considerably by bringing enough cattle together to attract cattle buyers.

Six years of data compared preconditioned calves to regular calves from auction markets. A more accurate measurement of the effect of preconditioning would compare calves from the same farm, half sold directly through the auction market and half preconditioned prior to sale. The procedure used in this study was to survey feedlots who purchased both regular auction market calves and preconditioned calves in terms of a comparison of health performance. Two commodity types were thus compared.

Preconditioned cattle were better healthwise. Regardless of whether calves stayed in Alberta or were shipped to Ontario, preconditioning decreased the sickness rate by over 50%, and had an even greater effect on death loss. It reduced death loss by two thirds. Some preconditioned calves still got sick, but they were generally a healthier product than regular calves.

Preconditioning for the cattle feeder means mainly improved health status. For preconditioning to really work for the cattle feeder, calves must perform better in the feedlot. Feedlot processing costs should be lower because money should not have to be re-spent on any vaccinations. Cattle feeders also have reduced risk. A disadvantage is the increased purchase price.

The dilemna for the cattle feeder is to determine whether benefits of preconditioning offset the increased purchase price. This will depend first on the particular operation. If a crew is already set up to process, then there may not be much of an saving in processing costs. Reduced risk may not be as important to a large cattle feeder as it is to a small operator. That still leaves the question of performance. Results indicated that preconditioned calves outperformed regular calves for about 60 days. Preconditioned calves know how to eat and drink and they do so immediately. Regular calves must learn to eat and find the waterer and so on. After 60 days, regular calves started to catch up and at 100 days their performance was equal to that of preconditioned calves. By market, there was no difference. That can be economically important to the cattle feeder. A purchase premium of 5 to 6 cents per pound may be hard to get back.

These results suggest that the best market for preconditioned calves is the small farm feeder who is not set up to process or handle sick calves and who does not want the risk and hassle of sickness. The worth of preconditioned calves is essentially what they are worth in terms of health cost. Some simple rules of feedlot disease economics can be easily calculated. With calves at $1.00 a pound, each cent per pound of purchase price equals a 1% death loss in 100 calves. Any reduction in death loss has to be substantial to justify a much higher increase in purchase price. One cent per pound purchase price equals a 50% treatment rate if treatments cost 10 to 15 dollars per calf. One cent per pound purchase price equals a 2% culling rate. The health cost may not be much greater than what the premium is. Buyers are likley now paying about all they can afford at 4 or 5 cents a pound premium for preconditioned calves.

This does not mean we should quit preconditioning. But we must recognize that the small feeder and the Ontario feeder will likely form the market for preconditioned calves. People who retain ownership of calves on both sides of weaning benefit the most, by preconditioning for themselves. Preconditioning programs continue to focus attention on the importance of doing a good job of weaning at 6 months of age at which time calves are most susceptible to health problems. From that standpoint alone, preconditioning is worthwhile.

New Medications

Two new vaccines, Somnuvin and Somtrim, are available for the treatment of haemophylus disease which causes acute brain infection and death. During the last few years, brain infection has been decreasing but the pneumonia aspect of the disease has been increasing. Haemophylus is now a significant cause of pneumonia. A study was conducted in a large feedlot in Alberta last fall, involving 10,000 head. Results demonstrated that haemopholus vaccination decreased death loss due to respiratory disease by 0.75%, which was cost efficient. Death loss in the entire feedlot had previously averaged 3.5%. If death loss were only 1.5%, a 0.75% decrease in death loss would not likely have occurred, but these vaccines may be considered for the prevention of pneumonia.

Precon PH has recently been introduced for the control of pasturella haemolitica, the organisn that causes shipping fever. It is to be used prior to stressful conditions, as a preconditioning treatment. Studies in 3 Alberta feedlots indicated no improvement in the sickness rates of auction market calves vaccinated with Precon PH after arrival in the feedlot (table 4) and only a slight improvement in calves vaccinated prior to shipment from the farm direct to the feedlot compared with calves vaccinated after arrival in the feedlot or control calves. Results suggested that the use of Precon PH may not be economical, even if administered prior to shipment.

A new vaccine has recently been developed for the control of the Bovine Respiratory Sinsitial Virus which is supposedly an important cause of pneumonia. It is known that the virus is widespread and present in about 70% of the cow herds. It is not known how important a cause of feedlot pneumonia BRSV is, or how effective the new vaccine is. I would suggest that if you want to use it, set up a small trial before you use it on a widespread basis.

Table 4. Effect of Precon PH on feedlot morbidity

Feedlot	Number	% Morbidity		
		Control	Precon PH Prior	Precon PH After
Auction Market Calves				
Number 1	522	55.1	-	58.0
Number 2	201	25.7	-	25.0
Number 3	130	26.6	-	28.8
Total	853	44.2	-	45.6
Farm Direct Calves				
Number 1	102	11.8	13.7	-
Number 2	397	17.8	13.1	12.9
Number 3	137	2.9	1.4	2.9
Total	603	13.6	7.8	9.7

RATION BALANCING

Dr. Roger D.H. Cohen
Dept. Animal & Poultry Science
University of Saskatchewan
Saskatoon, Sask.

Introduction

Good nutrition of beef cattle involves providing the animals with the correct balance and amount of nutrients to achieve a desired level of performance. Feedlot performance is measured as growth rate, feed intake, the relationship between these two traits or feed conversion and carcass composition.

An analogy can be made between a steer in a feedlot into which nutrients are poured and stored, and an oak wine cask into which wine will be poured and stored. If each oak stave is assumed to represent a nutrient being fed to an animal and the wine stored in the cask represents the growth rate of the animal, then the sum of the lengths of all the staves represents total nutrient intake. If all the staves are of equal length then the wine will fill to the top of the cask. If one or more staves is shorter than the rest the wine will only fill to the level of the shortest stave. If that stave is replaced then the wine will fill to the level of the next shortest stave and so on. The same thing will happen to a beef animal (figure 1). There is no point in providing a diet which is adequate in energy and calcium and more than adequate in vitamins and trace minerals but inadequate in protein and phosphorus. The animal will only grow as fast as the most limiting nutrient will allow and the efficiency of feed conversion will be reduced. In economic terms this means less return on the feed dollar invested.

The animal's requirements for nutrients do not remain static. They are influenced by genetics (large vs. medium frame size), growth rate and current liveweight. A ration may be balanced for a 500 lb steer entering the feedlot but the same ration will

not be well balanced for that steer at 800 or 1000 lb. Simply increasing the energy content by adding more grain does not constitute profitable ration balancing.

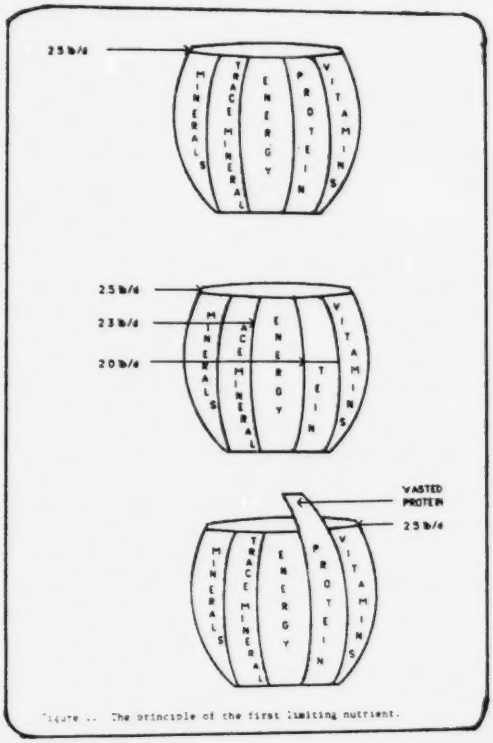


Figure .. The principle of the first limiting nutrient.

Feed Analysis

Ration balancing starts with feed analysis but feed analysis does not start in the feed testng laboratory. It starts with feed sampling. The analysis can only be as good as the sample. If the sample consists of part of one broken bale of hay then the analysis will be representative of that bale only. Feed quality can be highly variable between and within fields or other supply sources so the sample sent to the lab should be representative of the total feed supply. Core samples should be collected which are representative of the quality through the bale, not just on the outside of the bale. Core samples should be collected from at least 10-12 bales. If the hay is taken from two different fields or purchased from two different suppliers two composite samples should be collected and analyzed separately. In all likelihood one source will be fed at a time and therefore will require different ration balancing. The same principles apply for samples of silage and grain. Sample 15-20 different sites for silage and 8-10 locations in the grain bin. Advice and assistance can be obtained from your agricultural representative, livestock specialist or the Feed Testing Laboratory in Saskatoon. Costs of feed analyses can also be obtained from the Feed Testing Laboratory. The saving of just a few pounds of feed or the ability to ship your animals one or two days earlier will more than offset the time, trouble and cost of an accurate feed analysis. Only when the feed supply has been correctly sampled can you have confidence in the laboratory analysis.

Important Nutrients & Their Roles

Energy

Not a nutrient in the strict sense, energy is required in the performance of all body functions and is stored in the animal as liveweight gain.

The energy which an animal requires is contained in the organic matter fraction of the feed. Non-organic matter (otherwise described as ash or mineral) contains no energy but fulfills an essential nutritional function. Organic matter consists of carbohydrates (cellulose, hemi-cellulose, lignin, starch and sugar), protein, fats and oils. All these substances can be used as energy sources except lignin which is almost completely indigestible.

Digestible energy, the energy that an animal absorbs from its intestines, is commonly expressed as Total Digestible Nutrients (TDN). TDN is somewhat a misnomer because it does not include the digestible minerals. Net energy refers to the energy which, after digestion and metabolism in the

biochemical processes of the animal, is available for maintenance of liveweight, liveweight gain, normal body temperature, movement and health.

Protein

Protein is required for normal digestion and other body functions. It is a constituent of all hormones, enzymes, blood and body secretions and is the building block for skeletal and muscle growth. The role of protein is so far reaching that it is basic to life itself.

Protein consists of various combinations of amino acids that contain nitrogen (N) in different configurations but in similar concentrations. For this reason, protein is measured in the laboratory as N x 6.25. The ruminant, unlike the non-ruminant, can utilize non-protein-nitrogen (NPN) which is nitrogen that is not in protein form such as urea, ammonia and nitrate. Microorganisms in the rumen are able to convert NPN into microbial protein. Microbial protein is then digested and absorbed from the small intestine as true protein.

Minerals

The two most important minerals in terms of amounts required and cost in the ration are calcium and phosphorus. Approximately 99% of the calcium and 70% of the phosphorus of a beef animal is located in the skeleton. The requirement for these minerals is highest when the animal is growing the skeletal framework upon which it will later lay down meat protein and fat. Calcium is essential for blood clotting, muscular contractions, enzyme systems and hormones. Phosphorus is essential for the transference of energy in all metabolic systems and is important in many enzymes, amino acid metabolism and protein functions, fat metabolism and acid-base balance. Other minerals of significant importance are listed in table 1 along with suggested NRC requirements and tolerable levels.

Although the trace minerals are required in very small quantities (ppm), they are essential for growth and efficient feed conversion. Most Saskatchewan feeds usually contain adequate amounts of sodium, potassium and magnesium. There were suggestions that additional potassium may be needed to combat cold weather stress. Research conducted at the University feedlot did not support that suggestion. Trace mineral levels in Saskatchewan-grown feedstuffs are often inadequate. Concentrations of trace minerals vary depending on the source of the feed supply. These minerals interact with each other in a complex way. Excesses of one or more minerals may interfere with the absorption and metabolism of others. Noteable in Saskatchewan is the interaction between copper, sulfur and molybdenum where high sulfur contents (common in well water) and/or high molybdenum levels (common in many Saskatchewn forages) interfere with copper availability to the animal to the extent that otherwise adequate copper levels become inadequate for satisfactory health and production. This situation is compounded by the high incidence of feeds in the province that do not contain sufficient copper. The Department of Animal and Poultry Science recommends adding 25 ppm of copper in the ration, which is three times the level recommended by NRC.

Vitamins

Vitamins are essential components of many of the biochemical reactions which take place during normal metabolism in the animal. They are required in small amounts and like the trace minerals are of minor economic importance unless they are in insufficient supply. Vitamins are divided into the water soluble vitamins B and C and the fat soluble vitamins A, D, E and K. Animals with a developed rumen can usually synthesize all their requirements for the water soluble vitamins through microbial action in the rumen.

Table 1. Mineral requirements and maximum tolerable levels for beef cattle.

Mineral	Suggested Requirement	Maximum Tolerable Level
Cobalt ppm	0.1	5
Copper ppm	25	115
Iodine ppm	0.5	50
Iron ppm	50	1000
Magnesium %	0.1	0.4
Manganese ppm	40	1000
Molybdenum ppm	-	6
Potassium %	0.65	3
Selenium ppm	0.2	2
Sodium %	0.08	10
Sulfur %	0.1	0.4
Zinc ppm	30	500

Vitamin B12 requires the trace mineral cobalt for synthesis. There is evidence that in times of stress, particularly shipping stress associated with new cattle arriving at the feedlot, vitamin B synthesis may be depressed and additional dietary vitamin B may be required. Additional amounts of the fat soluble vitamins A, D and E may be required. Their cost is so small in comparison with the cost of providing sufficient energy, protein, calcium and phosphorus that they should be supplemented either by addition to the ration or by injection on a regular basis. The other fat soluble vitamin of importance is vitamin K which is involved primarily in blood clotting. Most feedstuffs contain sufficient amounts of vitamin K that a supplement should not be necessary. If sweet clover hay or silage which has some spoilage and hence a high dicoumarol level is fed, additional vitamin K may be required. Dicoumarol is an anti-coagulant. Extra vitamin K may be required to offset its anti- coagulant effects.

Nutrient Requirements

The requirements of a beef animal for nutrients will depend upon its sex, frame size, liveweight and growth rate.

Effect of sex

The sex of an animal influences the amount of energy needed for liveweight gain. At any given liveweight, heifers require a higher concentration of energy in the diet than steers and steers have a higher requirement than bulls in order to achieve the same rate of liveweight gain. Conversely, at any given concentration of energy in the ration, bulls gain at a faster rate than steers which in turn gain faster than heifers when all are at comparable liveweights. This is because of differences in their hormone profiles and fasting metabolic rates. At any given liveweight, the energy required to maintain liveweight is greatest for heifers and least for bulls (figure 2).

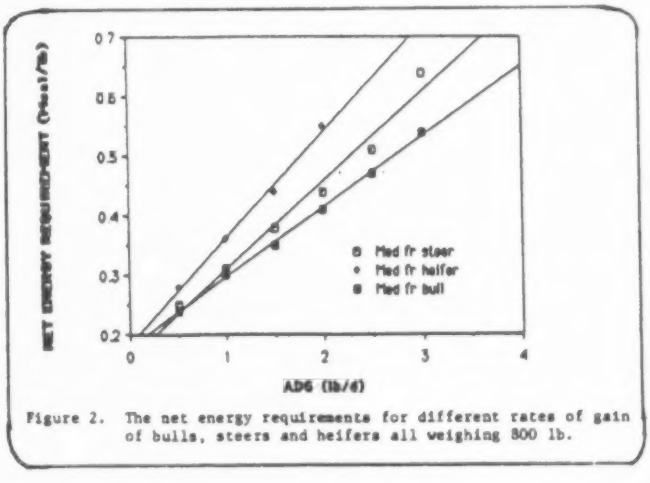


Figure 2. The net energy requirements for different rates of gain of bulls, steers and heifers all weighing 800 lb.

Effect of frame size & liveweight

Figure 3 indicates that steers of different frame size grow at different rates and lay down the correct proportions of fat:lean:bone for Canada A1 grading at different liveweights. Finished liveweights are reached at about the point where each curve begins to level out noticeably.

Not only is it inefficient to carry cattle beyond this liveweight because of down grading, but also because each unit of energy provided in the feed returns a greatly diminishing amount of energy in the carcass.

Figure 3 also highlights the different genetic potentials for gain in animals of different frame size at any given liveweight. The ration must be balanced according to this potential.

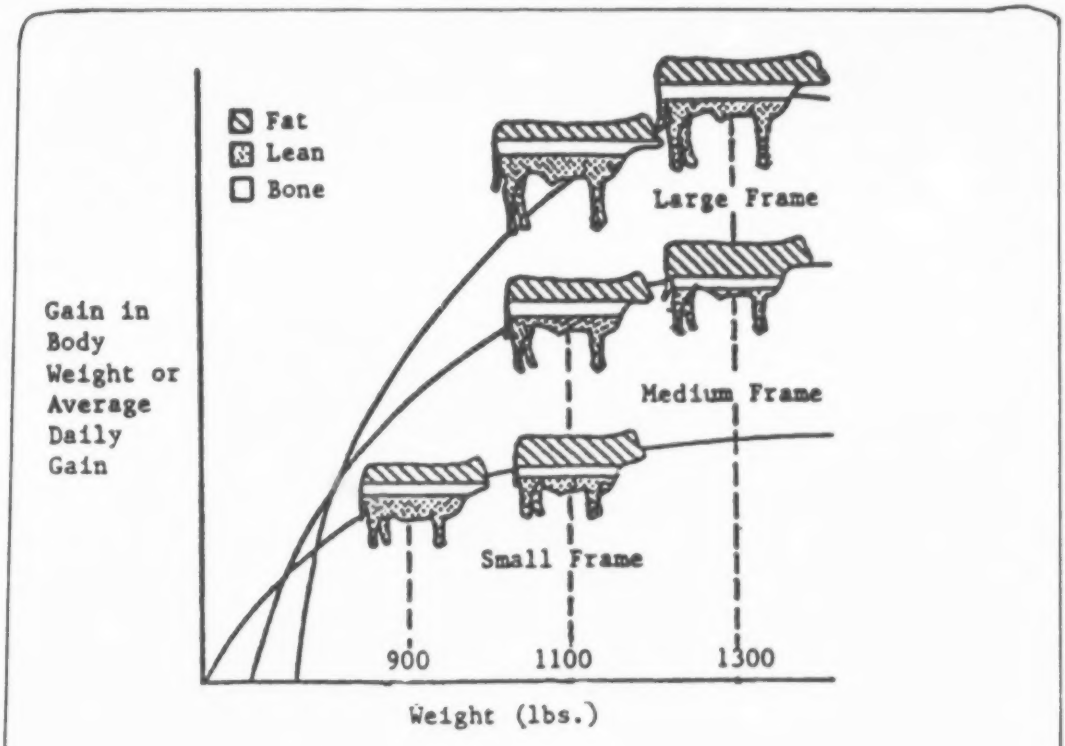


Figure 3. The growth curves and finished weights of steers with small, medium or large frame size.

At any given liveweight a large framed steer gaining 2.5 lb/day consumes slightly more feed and more net energy than a medium framed steer gaining 2.0 lb/day on the same ration (figure 4). The daily protein requirement of the large framed steer is considerably greater than that of the medium framed steer. This difference in protein requirement diminishes as the steers get heavier. Medium and large framed steers should be fed separately. They require rations which are balanced differently for protein. Although the protein requirement with respect to protein intake increases as the animal gets heavier, the concentration of protein required in the ration decreases by almost 50% from 300 to 1000 lb liveweight. Protein is an expensive ingredient. Careful attention to balancing the ration for protein will improve profit margins.

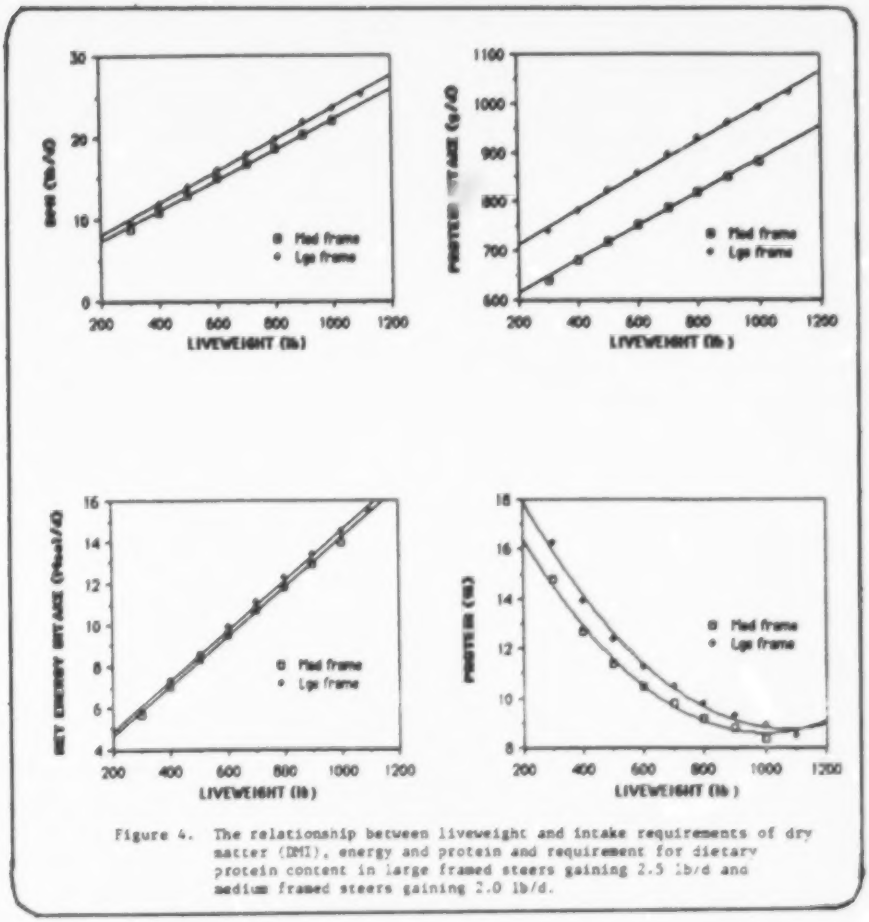


Figure 4. The relationship between liveweight and intake requirements of dry matter (DMI), energy and protein and requirement for dietary protein content in large framed steers gaining 2.5 lb/d and medium framed steers gaining 2.0 lb/d.

Similar differences exist in calcium and phosphorus requirements of medium and large framed steers gaining 2.0 and 2.5 lb/day (figure 5). As steers get heavier, % calcium and phosphorus decreases with the calcium requirement decreasing twice as fast as the phosphorus requirement. Feed intake increases at the same time. The net result is a decline in the absolute requirement for calcium but an increase in phosphorus. Both minerals are needed for skeletal growth which declines as the animal gets heavier. Phosphorus is also essential for energy transfer from the feed to muscle and fat. Since more energy is required to maintain growth of muscle and fat as the animal gets heavier, the amount of phosphorus needed to perform this task also increases as the animals gets heavier.

Effect of frame size & rate of gain

The energy or TDN requirement increases as the target average daily gain (ADG) increases (figure 6). This relationship remains more or less constant at all liveweights. Because medium framed steers eat less than large framed steers they need a higher concentration of energy to achieve comparable rates of gain. The greater the target ADG, the more divergent the requirement for TDN concentration. Different target ADG's should be considered for large and medium framed animals to achieve the desired carcass characteristics. A large framed steer gaining 2.5 lb/day will produce carcass characteristcis similar to a medium framed steer gaining 2.0 lb/day. Rations should be balanced accordingly.

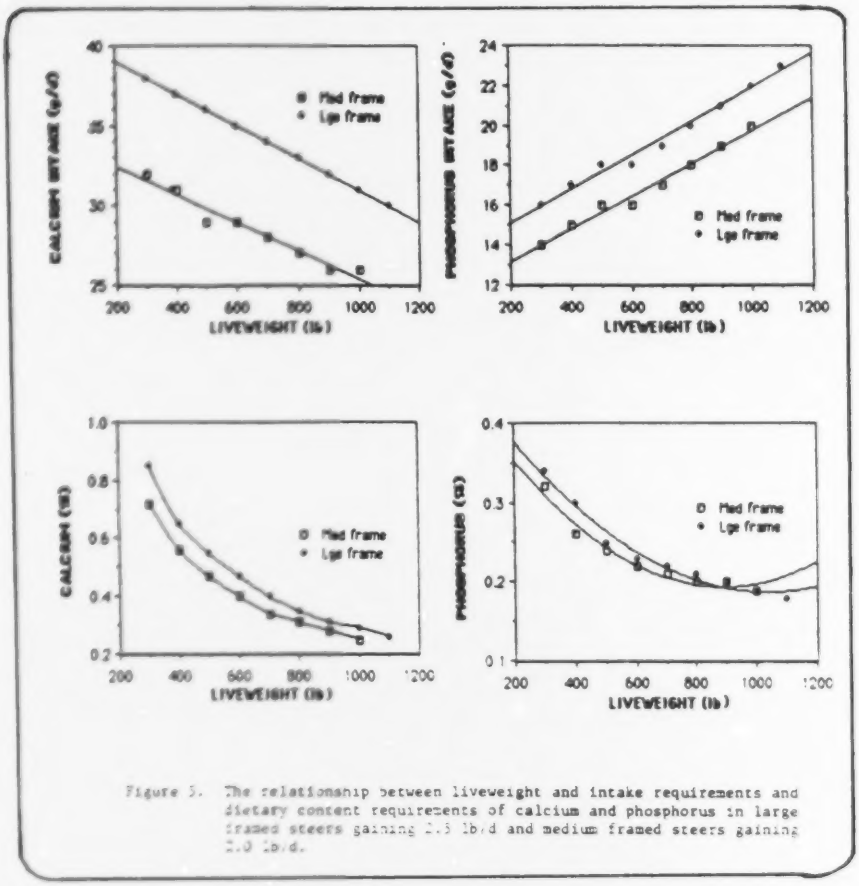


Figure 5. The relationship between liveweight and intake requirements and dietary content requirements of calcium and phosphorus in large framed steers gaining 2.5 lb/d and medium framed steers gaining 2.0 lb/d.

The requirements for protein, calcium and phosphorus for medium framed steers weighing 500 lb or 1000 lb and gaining weight at different rates are also shown in Figure 6. The ration fed to a 500 lb steer must be higher in protein, calcium and phosphorus than that given to a 1000 pound steer to achieve any desired target ADG. The ration formulation for protein, calcium and phosphorus increases more sharply per unit ADG for a 500 lb steer than a 1000 lb steer. Failure to adjust the ration for liveweight and target rate of gain will reduce profit margins.

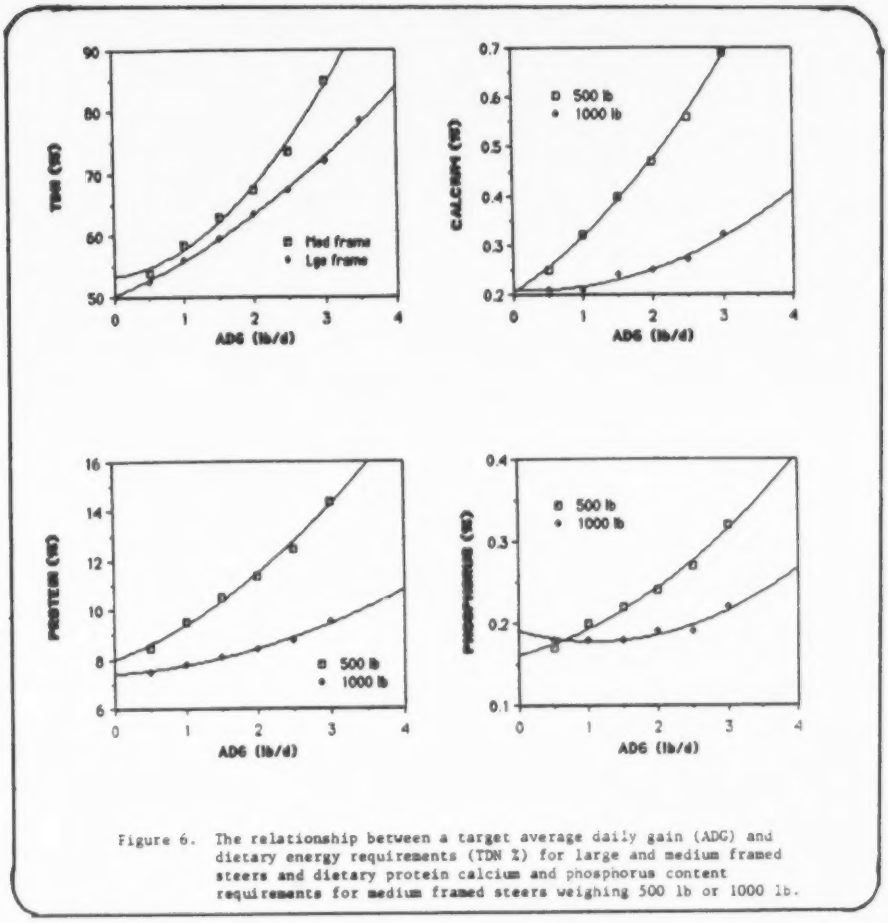


Figure 6. The relationship between a target average daily gain (ADG) and dietary energy requirements (TDN %) for large and medium framed steers and dietary protein calcium and phosphorus content requirements for medium framed steers weighing 500 lb or 1000 lb.

Formulating the Ration

Rations can be formulated using the Pearson Square method, algebraic simultaneous equations or by computer least cost formulations. Pearson Square can only be used to formulate two feed ingredients to provide a desired concentration of one nutrient. Simultaneous equations can be used to formulate two nutrients. Computer least cost linear programming feed formulating software is available for a number of popular personal computers. These programs will allow complete ration formulation for a determined concentration of all required nutrients from all listed feed sources on a least cost basis. Cattle feeders who have personal computers may consider purchasing one of these packages. I would not suggest that all who feed cattle this winter go out and purchase a computer and software, but they should obtain feed analyses on their feed supply and get assistance from the feed testing laboratory, livestock specialist, feedlot specialist or ag rep on the formulation of a ration to meet the requirements of the cattle to be fed. Any advice received will likely be based on computer least costing procedures.

Suggested Further Reading

National Research Council 1984. Nutrient Requirements of Beef Cattle. Sixth Revised Edition. National Academy of Sciences Press, Washington, D.C.

RECORD KEEPING

Ken Ewen
Poundmakers Feedlot Limited
Lanigan, Sask.

Record keeping is an important component of any cattle feeding operation. If accurate records are not kept, facts are not available on which to base management decisions. Custom feeders appreciate accurate record keeping which infers accurate billing. Lending institutions base their decisions on budgets and financial statements.

Records pertaining to each sector of the feedlot operation, including purchases, rations and other input costs, death losses and closeouts are important to efficient management.

When purchased cattle arrive at the feedlot, they should be sorted and weighed. Calculating shrink is a good check on how well your buyer is doing his job. Scale tickets and invoices should be checked for errors. Cost of purchase is often recorded on a group or lot basis.

Purchased feed supplies should be sampled and tested for moisture content to determine whether they meet specifications. The moisture content affects cost as well as ration formulation. Shipments of veterinary supplies should be checked to ensure they are what was ordered. Feed and veterinary supply inventories should be adjusted on an ongoing basis.

The cost of each ration should be calculated from ingredient prices, processing costs and markup and should be re-calculated whenever changes are made to the ration.

Input costs which are recorded for each lot include items such as feed, bedding, processing, sickness treatments, and wages and interest charges attributed to that lot.

A report should be prepared for each death loss that occurs. It should include information on pen number, lot number, sex, history of treatment and cause of death.

Finished cattle should be sorted and weighed prior to shipping. Shrink weights can be estimated for comparison to actual shrink reported on returns. Yield, price discounts, grades and bid prices stated on returns should be examined for accuracy.

A closeout should be calculated on each lot of cattle after the entire lot has been marketed. With data available on total feed intake, bodyweight gain and total finishing costs, average daily gain, cost of gain, feed conversion, death loss and profit or loss per lot can be calculated.

If records are current and accurate, financial statements can be prepared at any time. Accurate records are the key factor in preparing budgets and projections. Any system of record keeping can be used providing records are accurate and contain all pertinent information. Computerized programs assist with the speed at which management information can be obtained or calculated and custom invoices can be prepared.

Keeping accurate records is the best way to determine whether managment decisions were correct and to assist in the management decision-making process.

PERSONNEL/CUSTOMER RELATIONS

Terry J. Manning
Animal Health Division
Elanco Division of Eli Lilly Inc.
Calgary, Alberta

Introduction

When I was asked to give this presentation, two questions came to mind. Firstly, why this topic at a short course entitled "Ownership - From Calving Through Slaughter" and secondly, why would I be asked for this type of presentation?

Employee and customer relations are **motherhood** issues and should be at the top of every owner and manager's priority list at all times. That answered the first question.

The second question was a little more complex. The cattle feeding industry is very much in a development stage in Saskatchewan. Many feeders are moving from feeding only their own cattle to custom feeding and are enlarging their operations. This may mean adding staff or employing people, outside of the family, for the first time.

More thought must go into hiring and working with people of different backgrounds, talents and personal and work related needs.

In order to succeed in any business, people must be the most important consideration. No company can succeed without good people. When more than one or two people are involved in an operation, a formal structure needs to be considered.

A formal corporate structure is nothing magical. It is not just what large corporations or governments need to operate efficiently. It is merely allocating work responsibilities and delegating authority so that each member of the team knows what they are responsible for and to whom. A lot of thought must go into developing a structure that fits each unique set of requirements.

I feel I was asked to address this topic since I am employed by a large company, Eli Lilly, where without a proper organizational structure, nothing could be accomplished.

Employee Relations

Hiring

When hiring or adding staff for the first time, you must first ask yourself why you want or need someone. Is it to get a dirty job done that you don't want to do yourself? Can you no longer do everything yourself so you need help in specific areas? Does the job to be done require a special expertise? What is the job worth?

Never forget that you must feel that any job you are hiring for must be considered important. People doing the job must feel it is important or they will put little into doing the work properly. Dr. Larry Gell, a management consultant, expressed it as:

> "To succeed in business today you must surround yourself with good people who can do certain tasks better than you yourself can."

Be sure to hire or train people who can carry out their duties on their own. Do not hire "yes men" who do only what they are explicitly told to do.

Look at the position you are hiring for from the following points of view:

- does it require a specific expertise?
- could a consultant such as a veterinarian or nutritionist fill the bill?
- could working with suppliers help by utilizing their experts?

If your decision is to hire, consider whether the position is justifiable from an economic viewpoint, whether it will be part-time or full-time and whether realigning the present staff and using them more efficiently could eliminate the need to hire.

Hiring without good thought as to exactly what is needed can and will lead to many problems. You must feel that the position to be filled is important to the success of your operation. If it is indeed important you will more easily communicate this to applicants.

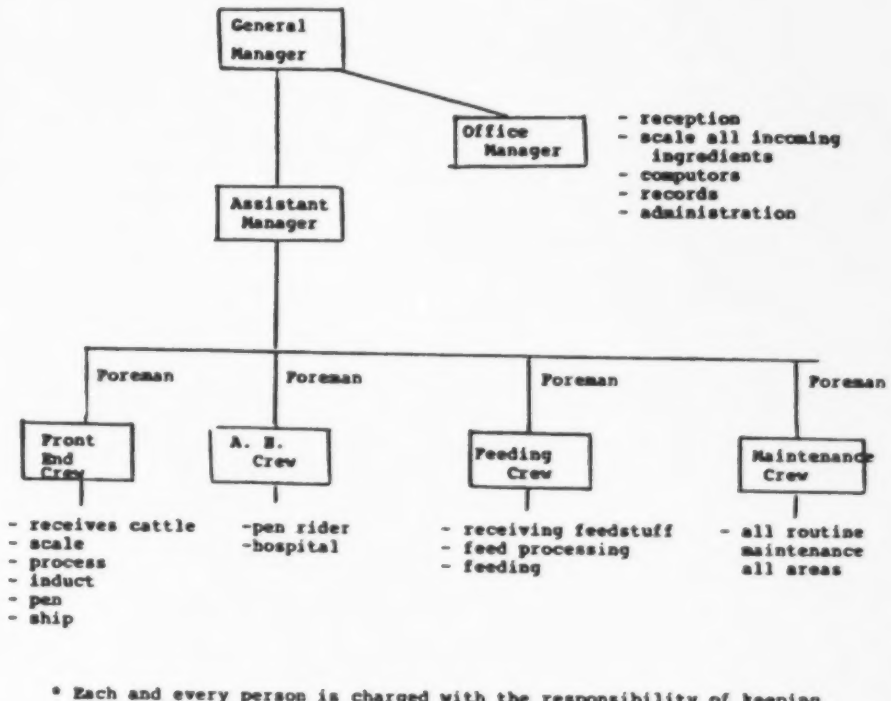
Corporate Structure

When only one or two employees are on staff in your feedlot, you can easily direct their activites. As the need for more people expands and you can't always be around, the need for a corporate structure grows. In a corporate structure each person has a definite responsibility in a definite reporting structure. The critical factor is letting the supervisor do his job without undue interference. Authority must be delegated down. That means having people that are competent and will do the job for you, the way you think it should be done.

How can a corporate structure be applied to a feedlot? I visited with Pat Fisher who operates a 15,000 head feedlot. I asked him if there was any benefit to even talking about corporate structures. He related to me the story of a man he knew that operated a large feedlot. The man said, "You know, I have all these people around. How will I ever get this thing organized and under control?" Pat then realized the value of a corporate structure and developed one for his feedlot (figure 1). This structure can serve as a model, keeping in mind that a structure must be developed that works for you and your people to efficiently accomplish the smooth operation of your feedlot.

FIGURE 1. FEEDLOT CORPORATE STRUCTURE

(15000 head custom feedlot)



* Each and every person is charged with the responsibility of keeping the feedlot looking in top shape.

In developing a corporate structure, the number one consideration should be people. Garnett Altwasser recently stated:

"Our only real assets are our People."

Similarly, Dofasco's ad states:

"Our product is steel, our strength is people."

You must never forget that without good people in all positions, your corporation cannot succeed.

If a decision is made to hire, know what job you are hiring for, know what qualifications are needed and be concerned about the individual's ability to assimilate with the current staff. Always be on the look out for the malcontent.

Always be sure that the immediate supervisor has a strong say in hiring and preferably the final decision. This will put the supervisor in a position where he will wish to ensure the success of the person hired.

When advertising for people, have realistic expectations. Consider the following taken from Kerri-Sue Lang's article in the September issue of the Country Guide:

> "WANTED: Skilled, dedicated, mature person to tend herd. Must be willing to work weekends. Must have progressive attitude. Phone after 11 pm or before 6 am."
>
> SHOULD READ: Experienced, single and graying with no outside interests who will work 365 days of the year and has no desire for any personal life, and who sees things the way the boss does.

The point of her article was not to expect too much, to be realistic in what is expected from an employee and to realize what is important to them.

Renumeration

Renumeration is of the utmost importance. Spell it out in specific terms so the employee knows exactly where he stands. Specify hours and days of work. Establish the base salary and be sure to explain what other benefits are included, such as health care, workmen's compensation, room, board, free meat, gas, heat, power and incentive bonuses. Surprise bonuses can be included as an incentive but cannot be the only form of incentive.

It is extremely important to keep good people. Finding and training people is expensive. As Kerrie-Sue Lang said in her article quoting Rolly Coy, manager of the east-central Ontario office of the Canada Farm Labour Pool:

> "Some of the more profitable farms would be smart to offer their help an extra $2000 per year, rather than lose them", says Coy. "That money means a lot to a worker but little to the farmer." When the end of the year rolls around, nothing is more frustrating to an employee than watching the farmer scramble to purchase equipment for tax purposes. Meanwhile, the employee's family ekes out a meagre existence, waiting for the boss to throw some of the extra profit their way in the form of a raise.
>
> Since farmers are proprietors, it stands to reason that they may be inclined to work 365 days of the year. They can't, however, expect the same enthusiasm and devotion from employees.
>
> Master the art of motivating people, and everything else will fall into place. Whether by instilling pride, showing appreciation for a job well done, or even offerring cash bonuses, giving an employee a reason to perform well will provide a much needed challenge. That in itself will keep good workers around longer. Incentive programs serve the purpose well. Perhaps these might provide reward for selling a number of pigs above a certain minimum, or for increasing butterfat percentage, or for exceeding any other measure of production. While Coy sees the obvious benefits of an incentive program, they can lead to major problems."

The value of a specific job can be determined by calling other feedlots and by carefully reviewing the expectations of the applicants. At Eli Lilly we use a number of salary surveys. We belong to the Canadian Animal Health Institute. This organization conducts an annual survey of all member companies to define the market and indicate where we stand. It may be possible to use your organizations in the same way.

Compensation Criteria and Performance Rating at Eli Lilly

We do an entire compensation workshop which is an ongoing process in our organization. Compensation workshops include items such as salary surveys, salary scales, merit increase guidelines, types and frequencies of salary increases, administrative

criteria for merit increases and salary discussions with the employee. All are complex issues that are very near and dear to the employees.

Salary administration criteria are performance rating, position in the range, past increase patterns, rate of movement, promotion potential, action taken with peers, effect of starting rates, meaningful size, employees perception, rate of absenteeism and safety habits. All these factors are reviewed when salary increases are being considered. Salary reviews are conducted on a regular basis every six months and when promotions, transfers, reclassifications or special adjustments are being considered. These items are included in a policy provided to employees so they know what to expect.

We also conduct performance ratings and use a merit guideline chart. The key is to get a person get to where you want him. Training is an important and ongoing process. You cannot assume that a person with experience is trained. Making assumptions can cause problems. Determine what training is required, for how long and by whom and outline job rotations. Spell these things out for new employees. This will increase their confidence in your operation and in that you are serious about having well trained people employed.

Job Descriptions

A job description lays down the exact expectations you have of a person. The following story spells out what can happen if you don't have job descriptions:

"What Went Wrong?

This is a story of four people, Everybody, Somebody, Anybody and Nobody. There was an important job to be done and Everybody was sure that Somebody would do it. Anybody could have done it but Nobody did it. Somebody got angry because it was Everybody's job. Everybody thought that Somebody would do it, but Nobody asked Anybody. It ended up that the job wasn't done and Everybody blamed Somebody, when actually Nobody asked Anybody."

I would bet that if you have an employee that just isn't cutting it, he likely isn't sure what is expected of him. To develop a job description, ask your employee to write out what he thinks his job is. Do the same yourself and compare the two. You will likely find that he had no idea what you expected of him.

Job descriptions should be exact and include all details of what the job entails and what you expect in the terms of dress, cleanliness and how customers should be handled.

Performance Appraisals

The performance appraisal gives you or your supervisor the opportunity to sit down with each person who reports to them and fully discuss the progress they are making. It should deal with all areas of the position and should summarize how things have been done over the past year. An appraisal should not take the place of addressing problems as and when they occur. It should not dwell on problems, but should spend equal time on success.

The person being appraised should complete a self appraisal prior to the formal review and this should be compared to the appraiser's opinion. The formal appraisal should take place in a neutral environment so that both people are comfortable.

It is important to review training needs, short and long term goals and have the employee make general comments as to his feeling about his job and how he views the company. This may help to avoid problems before they get out of hand and is an excellent attitude checker. In completing the appraisal a summary of key strengths, key accomplishments and ideas for improvement should be prepared.

Definitions of performance ratings are summarized in figure 2. The guideline to employee performance appraisal (figure 3) gives a comical and exaggerated description of each rating but makes the distinction between these somewhat intangible descriptions more readily understood.

FIGURE 2. DEFINITIONS OF RATINGS

SATISFACTORY (S)

INDIVIDUALS WHO PERFORM TASKS AT AN ACCEPTABLE LEVEL, HOWEVER, WORK PERFORMANCE MAY VARY DEMANDING ADDITIONAL SUPERVISION AND COUNSELLING. PERFORMANCE OR MANAGEMENT PROBLEMS SHOULD BE CONSIDERED TEMPORARY.

GOOD (G)

INDIVIDUALS WHO PERFORM AND PRODUCE COMPLETELY ACCEPTABLE RESULTS. SOLID PROFESSIONAL JOB PERFORMANCE. RESPECTED BY PEERS AND WORKS WELL WITH THEM. NO SIGNIFICANT OR PERSISTENT PERFORMANCE OR MANAGEMENT PROBLEMS.

VERY GOOD (V.G.)

INDIVIDUALS WHOSE PERFORMANCE ADDS NEW VALUE TO THEIR ASSIGNMENT AND TO THE CORPORATION. CLEARLY SUPERIOR AND TOTALLY PROFESSIONAL JOB PERFORMANCE. RESPECTED BY PEERS. PROVIDES AND/OR FACILITATES IDEAS IN THE WORKPLACE. PROVIDES LEADERSHIP, GUIDANCE OR ROLE MODEL FOR OTHERS IN HIS/HER GROUP. REACTS APPROPRIATELY TO PROBLEMS OR OPPORTUNITIES WITH MINIMAL SUPERVISORY REQUIREMENTS.

EXCELLENT (E)

INDIVIDUALS WHO TRULY ADD SIGNIFICANT NEW DIMENSIONS TO THE PERFORMANCE OF THE JOB. CLEARLY RESPECTED AND RECOGNIZED BY PEERS AND MANAGEMENT ALIKE. AMONG HIGHEST RANKING IN OBJECTIVE JOB MEASUREMENT AND RESULTS. DEFINITELY A ROLE MODEL AND POSITIVE INFLUENCER/LEADER IN THE GROUP. ASSISTS OTHERS (THROUGH EXAMPLE AND/OR ACTIVE TEACHING) TO IMPROVE THEIR JOB PERFORMANCE. ASSISTS MANAGEMENT THROUGH THE GENERATION OF IDEAS OR MANAGEMENT OF THE GROUP.

Exit interviews should be conducted when good employees are leaving. People often use money as the only reason for leaving a job but almost 100% of the time that is not the true or only reason. Don't let a good person go without being sure you have the real reason.

FIGURE 3.

GUIDE TO EMPLOYEE PERFORMANCE APPRAISAL

PERFORMANCE FACTORS	FAR EXCEEDS JOB REQUIREMENTS	EXCEEDS REQUIREMENTS	MEETS JOB REQUIREMENTS	NEEDS SOME IMPROVEMENTS	DOES NOT MEET MINIMUM REQUIREMENTS
QUALITY	LEAPS TALL BLDGS WITH A SINGLE BOUND	MUST TAKE A RUNNING START TO LEAP OVER TALL BLDGS.	CAN ONLY LEAP OVER A SMALL BLDG. OR MEDIUM ONE WITH NO SPIRES	CRASHES INTO BLDG. WHEN TRYING TO JUMP OVER	CANNOT RECOGNISE BLDG. NEVER MIND JUMP OVER.
TIMELINESS	IS FASTER THAN A SPEEDING BULLET.	IS AS FAST AS SPEEDING BULLET.	NOT QUITE FAST AS A SPEEDING BULLET.	WOULD YOU BELIEVE A SLOW BULLET.	WOUNDS SELF WITH BULLET ATTEMPTING TO LOAD GUN.
INITIATIVE	IS STRONGER THAN A LOCOMOTIVE	IS STRONGER THAN A BULL ELEPHANT	IS STRONGER THAN A BULL.	SHOOTS THE BULL.	SMELLS LIKE A BULL.
ADAPTABILITY	WALKS ON WATER CONSTANTLY	WALKS ON WATER IN EMERGENCIES	WASHES WITH WATER	DRINKS WATER.	PASSES WATER IN EMERGENCE
COMMUNICATION	TALKS WITH GOD.	TALKS WITH ANGELS	TALKS TO HIMSELF.	ARGUES WITH HIMSELF.	LOSES ARGUEMENTS WITH HIMSELF.

Motivation

Motivating people to produce or do a better job can be accomplished by fulfilling the following five needs:

1) Economic Security. Workers should feel that their time and effort will be fairly rewarded.

2) Emotional Security. Management must create a climate in which employees "trust" their supervisors and feel that their job contributes to a worthwhile goal.

3) Recognition. Employees should feel that good work will be appreciated and praised.

4) Self-Expression. We live in a democracy and none of us should feel that we surrender that heritage when we enter our place of employment. Employees should have the right to communicate positive ideas, suggestions, fears and opinions to their superiors without fear of retribution.

5) Self-Respect. This is simply the need to be treated as an individual, as a human being - not a statistic.

I want to conclude this particular section with A Supervisor's Prayer, written by John Luther. It may be worthwhile to occasionally read this when working with other people. Employees are your number one consideration. If they are not, they should be. You will not succeed without them.

A SUPERVISOR'S PRAYER

Dear Lord, please help me --

To accept human beings as they are - -

not yearn for perfect creatures;

To recognize ability -- and encourage it;

To understand shortcomings -- and make

allowance for them;

To work patiently for improvement - - and

not expect too much too quickly;

To appreciate what people do right - -

not just criticize what they do wrong;

To be slow to anger and hard to

discourage;

To have the hide of an elephant and

the patience of Job;

In short, Lord, please help me be a

better boss!

Customer Relations

Non-Secrets of Selling Your Feedlot

Once you enter into a customer relationship, you become a salesman. Because you are in the position of wanting to have people place cattle in your feedlot, you and everyone working for you must become a salesman.

Regardless of what we do in life we are all salesmen. A salesman is a communicator and the ability to communicate separates good sales people from bad. Scientists sell their capability to their employer and their developments to a Sales and Marketing Team. Doctors sell their ability to daignose and treat disease. Teachers sell their ability to transfer knowledge from books and themselves to pupils. Custom feedlot operators and their staffs sell their ability to receive, handle, feed, care for the health of and market another man's cattle at least as good as or preferably better than the feedlot down the road. Feedlot operators must use all the skills of the most accomplished salesmen they know.

Selling must start with the general manager. He must be able to work with each customer or prospective customer. Customers come in all shapes and sizes and have very diverse personalities and reasons for feeding or considering feeding cattle.

The owner/operator, the general manager and the entire staff must be able to translate what your feedlot has to offer into benefits your customers want. In sales, we think in terms of FAB, feature, advantage and benefit. Always remember no one buys a feature or an advantage. Products are bought for what they will do for us, for the benefits they can provide.

Consider, for example, the purchase of a new feed wagon. You don't buy it for its feature of an approved electronic scale with cab mounted printer. You don't buy its advantage of exact weights approved by weights and measures or its advantage of having a print of the exacts amount delivered to each pen. You buy the benefit of knowing exactly how much feed your cattle receive and you are charged for exactly that - no more and no less.

For whatever reason people feed cattle, you must communicate that you can fulfill their needs. Never forget for one moment that you must continue to keep your steady customers pleased with your yard while attracting new customers to your feedlot and to your industry. All these efforts require salesmanship.

Reputation and Image Making

The reputation of your yard is important. It is imperative that your best face is always showing. You must develop and maintain a reputation of quality and integrity. Absolutely nothing must ever be allowed to question your integrity. Everyone you come into contact with will form an opinion of you and your operation. Make sure that they appreciate the integrity and reputation of your yard.

Impressions of your feedlot and how well it is run are based on all aspects of your feedlot operation. The phone in your office is important. Be sure that whoever answers your phones has a polite, friendly and helpful manner. Do not allow anyone to be abrupt or abrasive 'ever' on the phone. In all aspects, the customer may not always be right, but is always the customer.

Take care of the appearance of your feedlot. First impressions often affect later decisions. On driving in, potential customers should view a well maintained, clean, weed free and junk free feedlot.

Your office should make customers feel comfortable. The office should be clean and for all practicle purposes it should have a crew area adjoining but separate from where you meet customers.

Feedlot tours can be useful in establishing a good reputation. Always be sure your current customers see their cattle. Be sure potential customers get a full tour. Don't forget guests who may further your cause. On a tour, point out the best parts of your operation. Be sure your people are always receptive to all visitors, but that they are working and not wasting time. Be sure they are handling cattle with proper care and caution. No one likes to see animals improperly cared for or handled.

From a public relations aspect, ensure that your records have the detail to show customers or prospects exactly what you have to sell. Be sure your prospect or client knows how you order and buy your cattle, how you monitor your order buyer to ensure the quality ordered is purchased and how you receive and process incoming cattle. Record all aspects of the cattle's stay at your yard, including processing, feeds and feeding program, animal health, treatment records and charges, mortality and post-mortem results, shipping decisions, close out records and the final payment. This may be a short list. Inform your customer of any special details you can provide. Be sure you know what your customer really wants. Too much information can be as bad as not enough.

Your image as a cattle feeder is a result of everything you do publicly. It is a result of all the things your employees do, your appearance, your employee's appearance, your yard's appearance. It is the way you and your people talk and handle yourselves. It is the shape your equipment and facilities are in. It is your policies, programs and pricing. Everything affects your image and that is what you are selling. In short, image is the sum of your total market mix.

Conclusion

The only real difference between a good company or feedlot and a bad one are the people and how they do their jobs. Good mamangers are those who get the very best out of their people. A feedlot veterinarian recently said, "You can't inject good management". Without giving real consideration to good management you are destined to fail. Good management will ensure success. You are professional cattlemen. You should be proud of yourselves and your industry. Show it in everything you do each and every day.

STEER AND HEIFER FUTURITY PROGRAM

Rick Koller
Feedlot Specialist
Saskatchewan Agriculture
Saskatoon, Sask.

When introduced to the Steer and Heifer Futurity Program, cow-calf operators most often ask why the program is called a futurity. Futurity basically refers to the performance of cattle and to producers' expectations in conjunction with the performance of their cattle taken to a feedlot for finishing. It also encompasses the expectations of improved performance in the future.

The need for breeding plans in the cattle industry is widely recognized. Small cow-calf operations may not be adapting too quickly to technology and may be finding few rewards in it. That is evident from time to time but I am optimistic that all producers, including small operators, will continue to ask real questions about improving their herds, their productivity and the performance of their animals to finish.

It has been estimated that the investment in a cow up to the time it weans its calf is around $3000. Many times, ownership changes at the time. For a fraction of that investment, in the range of 15 to 20% of what has already been invested, the ownership and finishing of that calf could be retained.

The objective of the Futurity Program is to measure performance of the cattle beyond the farm gate so to speak, whether ownership changes or not. If ownership does not change it may be a little easier to relate back to the particular producer of those cattle how well they perform. A great deal is heard and understood about the heritability of post-weaning or feedlot traits of calves. However, a poor job is done of recording and providing feedback on exactly how those cattle perform. The futurity program hopes to go another step forward to reflect the profitability

of breeding and the rewards that breeders should receive or that a person with a breeding plan should receive for producing a superior product.

We have, to date, always relied on the market place to measure feedlot performance and to assure that the individual producer is getting top dollar for his cattle. For many years Canada has had a Record of Performance program through which birth and weaning weights are measured. After weaning, the need for that type of information seems to have been discounted. Those people who have traditionally struggled a little harder to feed out their calves, particularly on the paternal side of their herd if they are breeders, need that information to do a proper job of building and improving their herds.

One young man I know realized, at least in his training, the value of genetics during the different growth periods of cattle. In order to improve his herd when he took over his father's operation he ended up having to go to a system of finishing his own cattle on the farm in order to get the performance data he required. After about 5 years he changed his entire herd, much to the dismay of his father. After looking at the data, the father came full circle as well. So certainly the information that an individual can put together with a properly run demonstration project would help to carry the Futurity Program on, even after the project funding has been depleted.

We know that a good deal can be done with changing calving intervals, birth weights and weaning weights. The Futurity Program will hopefully recognize the value of feedlot traits.

Each feedlot operation enrolled in the Futurity Program will be finishing two groups of cattle, a control group and a performance group. The control group will be randomly selected from the market or from herds where there has been no deliberate attempt by producers to select their cattle. Visual appraisal will be used to select a control group of similar frame size and age as the performance group. The performance group is defined rather loosely. It does not necessarily have to be attached to breeds or cattle that have total records on birth weights and weaning weights but the more information available the better. Performance cattle are those from herds where the individual involved has done some selecting in either the bulls he buys or the females he retains and has a breeding plan he follows.

Feedlots are entertaining early booking so they have enough cattle from groups of farmers of the type they will be finishing off. Formal booking will take place once the control cattle are lined up. The person custom feeding will negotiate with the feedlot the traditional type of custom feeding arrangement, much the same as he has always done. The project offers a 3 cent per animal yardage reduction to the cattle owner. Arrival date of performance cattle will be negotiated to coincide with the arrival of the control cattle. Timing is crucial.

Feed testing will be undertaken by one lab. The weighing program is very specific and very clear. Cattle will be tagged on entry and individual weights will be matched with those tags. Treatments received by the cattle will be recorded. Feed records will be maintained. Carcass appraisal information will be collected through the Agriculture Canada Blue Tag program.

Sixteen feedlots are currently enrolled in the program. About one third of those have 1800 to 2000 head of cattle tentatively booked. Producers are now deciding what to do with their calves so we expect that all sites will be booked shortly.

Results of the program will be published at the end of each year. Hopefully, the numbers can be analyzed and will show the merits of genetic improvement in the herds involved.

Retained ownership is welcomed in the program. It is hoped that the performance information collected will get back to the origin herds. If retained ownership is not used, we would like the feedlots to maintain contact with the sources of their performance cattle so the information can be put to use.

Discussion

Q. What standards or uniformity are you placing on management, health, feeding and so on?

A. Nearly everything is left up to the individual feedlot operator and his traditional management practices. The only thing defined is the feed analysis that corresponds to ration balancing but even the ration components and the rate cattle are put on feed are up to the manager.

There could be, if there are 10 or 12 sites involved, that many projects. We won't be able to correlate from lot to lot very easily. There are at the moment 2 or 3 groups of Simmental cattle booked into the program. To what extent we can draw numbers apart remains to be seen. As the program continues and people are putting more thought into it, decisions of how these cattle will be managed are becoming more disciplined. That was the product that I had hoped would happen, rather than dictate how the program should work. In hopes of an ideal research project, no. We have taken the attitude that farmers will build a pretty good objective mind. There is no minimum number from each original source of cattle, as long as they are similar to the group they will be included in. By and large, performance cattle will be within 60 to 70 days of age.

SASKATCHEWAN CATTLE FEEDERS ASSOCIATION SORGHUM PROJECT

Gail Gerber, Technician
Sask. Cattle Feeders Assoc.
Sorghum Project
Oxbow, Sask.

The purpose of this project was to determine the feasability of growing the recently developed varieties of sorghum-sudan grass hybrids in Saskatchewan. Sorghum-sudan grasses have been around for many years but the hybrid was developed only within the last three years. Data concerning proper planting techniques, weed control, harvesting and yield to be expected in Saskatchewan are limited. Objectives were to identify the production levels of various soil types and various heat unit areas in the province and to compare the production of sorghum-sudan grass with that of forage crops commonly grown.

Four heat unit areas of the province were surveyed. Twelve co-operating farms in each area were involved. Each farmer provided information on methods of seeding, pounds seeded per acre, history and condition of the field in terms of whether it had been continuously cropped or summerfallowed in a rotation program and weed populations and the success rates of various types of herbicides used. Harvesting method, date and other pertinent observations were recorded.

The project was a demonstration only. No structured research was attempted. Producers who grew sorghum-sudan grass were not required to follow any specific farming practices. The following comments are based on observations gathered throughout the summer.

One field in the Estevan area was seeded on June 7 by broadcasting 17 pounds of sorghum-sudan grass per acre. The grass was sown on sorghum-sudan stubble, fertilized, cultivated and pressed with a drill. It came up patchy but by mid August was quite tall. The sorghum-sudan grass was cut on August 23, baled on August 30 and yielded 3.16 tons per acre. The

producer noted that sorghum-sudan grass baled well if in a dry condition.

Another field in the same area that had been continuously cropped for the past 15 years was planted on June 10 at 20 pounds per acre and fertilized. The field was heavily infested with wild millet. It was sprayed with 1.5 pounds atrazene and 1.5 liters oil on June 25. One end of the field was sprayed twice. Two days later the crop yellowed and holes in the sorghum leaves were evident. The sorghum came back within 2 weeks. Wild millet was effectively controlled when sprayed in this season when adequate rainfall was received.

Sorghum-sudan grew very tall. Stands of 5 to 6 feet in height were not uncommon. Many producers remarked that the swaths seemed to dry down to nothing, but the tonnage was still there.

When a field was sprayed with atrazene and oil when the sorghum-sudan grass was 3 feet tall, no harm was done to the plants. Atrazene did not burn sorghum-sudan grass at all.

When sorghum was emerging, grasshoppers liked it as well as any other crop. At the 3 week stage and at a height of 6 inches, grasshoppers left it alone. Prussic acid content may have been responsible. Spraying with insecticides was not harmful to sorghum-sudan grass.

Sorghum was planted in a Gleaned field. Glean effectively eliminated any sorghum-sudan growth, which was similar to results obtained by other producers who had seeded sorghum-sudan grass into pre-emergent herbicide treated fields.

In the Eatonia area, sorghum-sudan grass was seeded with a hoe-drill. Because conditions had been very dry for the last two years, this producer seeded the sorghum-sudan grass about 2 1/2 inches deep or to moisture. The stand yielded 4.16 ton per acre compared to a barley field that yielded 6 ton per acre. The last two weeks of July and the first 2 weeks of August were very cool and damp, not providing ideal growing conditions. The stand had been sprayed with 2-4D and Banvil which set it back a great deal.

Another field where alfalfa had previously been grown and weeds were a problem was seeded to a depth of 1/2 inch. Growth was uneven, likely because the seed was placed too shallow. The stand yielded 8 ton per acre silage when cut during the first week of August. A second cut during the first week of September yielded another 4 ton per acre. The stand had been irrigated once. This producer who also grew corn noted the lower water requirement of sorghum-sudan grass compared with corn. As well, sorghum-sudan grew much taller under irrigation than did corn.

One stand of sorghum-sudan grass grown south of Yorkton yielded 3.5 ton per acre when grown on very sandy soil.

An interesting aspect of sorghum-sudan grass is how it collected dew in its whirl and possibly utilized moisture in this way. In a drought condition, it curled its leaves and tried to pull itself in. Sorghum-sudan grass was dormant during drought, but grew again when it rained, as opposed to most cereals that burned during a drought.

Many producers commented that sorghum-sudan grass bales liked to slide and were difficult to keep in a good stack. One farmer alternated sorghum-sudan with alfalfa bales and solved the problem.

Summary

1. A seeding depth of 1 to 1 1/2 inches or to moisture seemed to be the proper depth for seed germination . Planting 1/2 inch deep or near the surface did not provide enough moisture for proper germination.

2. Weed control was an essential element in the successful growth of sorghum-sudan grass. Sorghum-sudan grass did not compete well with weeds, especially during the emerging stage.

3. If sorghum-sudan grass was to be baled, cutting it when the stand was 4 feet in height when the stalks were smaller in diameter produced a better quality feed. Also, if cut a little earlier, many producers got a second cut when moisture was adequate.

4. If crops were sown crossways or kitty-corner and swathed back and forth, the swath tended to lay on top rather that fall through the stubble.

5. Cutting the sorghum-sudan grass just when it began to tassle appeared to improve the protein content and volume of silage produced.

6. Sorghum-sudan fit in well with crop rotation and continuous cropping techniques. Under continuous cropping, fertilizing was beneficial.

7. Prussic acid poisoning was not a problem if time was allowed (4 to 6 weeks) for the prussic acid to dissipate from the crop. There are certain conditions that allow higher concentrations of prussic acid. Our producers had samples analyzed for prussic acid content prior to feeding.

8. Sorgum-sudan yielded well on marginal land when fertilizer was used and weeds were controlled.

9. Sorghum-sudan grass did not grow well in low areas or sloughs. That may have been the result of soil temperature or salinity.

10. Sorghum-sudan did not grow on Glean or similar pre-emergent herbicide treated fields.

Silage yields averaged 7.2 ton per acre (high of 8.5 ton and low of 4.5 ton per acre). Baled sorghum-sudan grass yielded 1.84 ton per acre on average, with a high of 3.16 ton and a low of 1 ton per acre. Alfalfa grown in the same areas as sorghum-sudan grass averaged 1.4 ton production per acre (high of 1.9 ton and low of 0.75 ton per acre, including one field of irrigated alfalfa). Wheat silage grown in similar areas yielded 5.5 ton per acre. Barley grain yielded 66.7 bushels per acre which, converted to silage, would have been 5.5 ton per acre. Yield estimates were not converted to an equal dry matter basis which would have been more relevant and meaningful.

Feed analyses indicated an average protein content of 12.3% (high of 16.43% and low of 10.37%) in samples from 6 fields. Energy content averaged 51% TDN, with a high of 54% and a low of 49% TDN. Estimates of nitrate content ranged from nil to 1.71. The stand that produced a nitrate content of 1.71 had been excessively fertilized with nitrogen. Moisture ranged from 50 to 70% in sorghum-sudan silage.

Atrazene is highly residual and could impair other crops grown after sorghum-sudan. 2-4D and Banvil were successful in weed control if sprayed early, definitely before the stand was 8 to 10 inches tall. Atrazene was used in areas where corn was included in the crop rotation. The use of lower rates of Atrazene application should be studied.

Proper fertilization rates for sorghum-sudan grass could not be derived from this project. Soil testing should be done on individual fields where sorghum is to be grown.

CLOSING REMARKS

Ken McDonald, President
Saskatchewan Cattle Feeders Association

The third annual short course has been an outstanding success as far as the Cattle Feeders are concerned. We are really pleased with the events that have taken place during these past two days. With your participation and excellent speakers, a lot of good information has been put forward. I want to sincerely thank the sponsors and exhibitors. Without their cooperation and help, these functions cannot be put on. I hope everyone will go home and apply some of the information they were presented with here to their own operations. Our organization holds its annual meeting in conjunction with Farm and Home Week, rather than the livestock convention. The University of Saskatchewan wanted more livestock orientation with Farm and Home Week and it has worked out very well for our association, both in terms of location and time. We need your participation and attendance at all functions we sponsor in order that they may continue. We are dedicated to improving the professionalism of the cattle feeding business in Saskatchewan. There is only one way we can do that, with you. Special thanks to Bruce Hobin of the Extension Department at the University of Saskatchewan. Without his help, this affair would not have gone as smoothly as it has.